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HEALTH AND SAFETY PLAN SAMPLING INVESTIGATION FOR THE MUNITIONS
RESPONSE PROGRAM SITE ACTIVITIES AT NSA CRANE IN
08/01/2009
TETRA TECH NUS INC

Health and Safety Plan
Sampling Investigation
for the
Munitions Response Program (MRP)
Site Activities
at
Naval Support Activity
(NSA) Crane

Crane, Indiana



Naval Facilities Engineering Command
Mid-West

Contract Number N62472-03-D-0057

Contract Task Order F272

August 2009

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SAMPLING INVESTIGATION
FOR THE
MUNITIONS RESPONSE PROGRAM (MRP)
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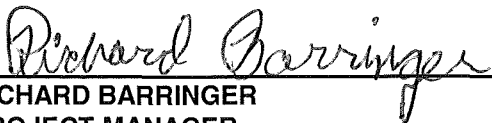
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1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been developed to provide practices and procedures for Tetra Tech NUS, Inc. (TtNUS) personnel engaged in investigation activities at the Naval Support Activity (NSA) Crane, Crane, Indiana. In addition to the HASP, a copy of the TtNUS Health and Safety Guidance Manual must be present at the site during the performance of site activities. The Guidance Manual provides supporting information pertaining to the HASP, as well as TtNUS Standard Operating Procedures (SOP's). Both documents must be present at the site to comply with the requirements stipulated in the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response standard or HAZWOPER).

This HASP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work at the site. The HASP will be modified, if new information becomes available. Changes to the HASP will be made with the approval of the TtNUS Project Health and Safety Officer (PHSO) and the TtNUS Health and Safety Manager (HSM). Requests for modifications to the HASP will be directed to the PHSO, who will determine if the changes are necessary. The PHSO will notify the Project Manager (PM), who will notify affected personnel of changes.

1.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibility for site safety and health for TtNUS employees engaged in onsite activities. Personnel assigned to these positions will exercise the primary responsibility for onsite health and safety. These persons will be the primary point of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for onsite activities.

The TtNUS PM is responsible for the overall direction of health and safety for this project.

The PHSO is responsible for developing this HASP in accordance with applicable OSHA regulations. Specific responsibilities include:

- i. Providing information regarding site contaminants and physical hazards associated with the site.
- ii. Establishing air monitoring and decontamination procedures.
- iii. Assigning personal protective equipment based on task and potential hazards.
- iv. Determining emergency response procedures and emergency contacts.
- v. Stipulating training requirements and reviewing appropriate training and medical surveillance certificates.

- vi. Providing standard work practices to minimize potential injuries and exposures associated with hazardous waste work.
- vii. Modifying this HASP, as it becomes necessary.

The TtNUS Field Operations Leader (FOL) is responsible for implementation of the HASP with the assistance of an appointed Site Safety Officer (SSO). The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.

The SSO supports site activities by advising the FOL on the aspects of health and safety on site. These duties may include:

- i. Coordinates health and safety activities with the FOL.
- ii. Selects, applies, inspects, and maintains personal protective equipment.
- iii. Establishes work zones and control points in areas of operation.
- iv. Implements air monitoring program for onsite activities.
- v. Verifies training and medical clearance of onsite personnel status in relation to site activities.
- vi. Implements Hazard Communication, Respiratory Protection Programs, and other associated health and safety programs as they may apply to site activities.
- vii. Coordinates emergency services.
- viii. Provides site-specific training for onsite personnel.
- ix. Investigates accidents and injuries (Attachment I – Incident Report Form)
- x. Provides input to the PHSO regarding the need to modify, this HASP, or applicable health and safety associated documents as per site-specific requirements.

The Unexploded Ordnance (UXO) Technician will be responsible for advising the Project Manager on UXO matters, including the measures that will be necessary to effectively implement and adhere to the Unexploded Ordnance and Chemical Warfare Agents Activities SOP. (Attachment II). Duties will include the following:

- i. Conducting UXO avoidance surveys prior to and during site activities.
- ii. Participating in site specific training sessions.
- iii. Maintaining familiarity with the TtNUS UXO SOP.
- iv. Conduct daily and in progress functional tests on instruments used in the survey
- v. Conduct the instrument assisted survey with the Site Geologist
- vi. Keeping current with pertinent new information and technologies.

Compliance with the requirements stipulated in this HASP is monitored by the SSO and coordinated through the TtNUS HSM.

In some cases one person may be designated responsibilities for more than one position. This action will be performed only as credentials, experience, and availability permits.

1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS**Site Name:** Naval Support Activity Crane **Client Contact:** Thomas Brent**Address:** 300 Highway 361 Crane, IN 47522-5001 **Phone Number:** 812-854-6160**Purpose of Site Visit:** Site Investigation at Crane**Proposed Dates of Work:** August 2009 until completion**Project Team:**

TtNUS Personnel:	Discipline/Tasks Assigned:	Telephone Number
<u>Rick Barringer</u>	<u>Project Manager (PM)</u>	<u>(412) 921-8524</u>
<u>James Goerd</u>	<u>Field Operations Leader (FOL)</u>	<u>(412) 921-8425</u>
<u>Ralph Brooks</u>	<u>UXO Manager</u>	<u>(770) 413-0965, ext. 231</u>
<u>Matthew M. Soltis, CIH, CSP</u>	<u>Health and Safety Manager (HSM)</u>	<u>(412) 921-8912</u>
<u>Jennifer Carothers, PhD</u>	<u>Project Health and Safety Officer (PHSO)</u>	<u>(412) 921-8083</u>
<u>TBD</u>	<u>Site Safety Officer (SSO)</u>	<u>TBD</u>

Non-TtNUS Personnel	Affiliation/Discipline/Tasks Assigned
<u>TBD</u>	<u></u>

Hazard Assessment (for purpose of 29 CFR 1910.132) for HASP preparation has been conducted by:

Jennifer Carothers, PhD

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section has been developed as part of a planning effort to direct and guide field personnel in the event of an emergency. Site activities will be coordinated with the client contact, Tom Brent. In the event of an emergency which cannot be mitigated using onsite resources, personnel will evacuate to a safe place of refuge and the appropriate emergency response agencies will be notified. It has been determined that the majority of potential emergency situations would be better supported by outside emergency responders. Based on this determination, TtNUS will not provide emergency response support beyond the capabilities of their training. Workers who are ill or who have suffered a non-serious injury may be transported by site personnel to nearby medical facilities, provided that such transport does not aggravate or further endanger the welfare of the injured/ill person. The emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. The NSA Crane site contact, Tom Brent, will be notified anytime emergency response agencies are contacted. This Emergency Action Plan conforms to the requirements of 29 CFR 1910.38(a), as allowed in 29 CFR 1910.120(l)(1)(ii).

TtNUS will, through necessary services, provide the following emergency action measures:

- Initial stage fire fighting support and prevention
- Initial spill control and containment measures and prevention
- Removal of personnel from emergency situations
- Initial medical support for injuries or illnesses requiring basic first-aid
- Site control and security measures as necessary

2.2 EMERGENCY PLANNING

Through the initial hazard/risk assessment effort, emergencies resulting from chemical, physical, or fire hazards and Unexploded Ordnance (UXO) are the types of emergencies that could be encountered during site activities.

To minimize and eliminate the potential for these emergency situations, pre-emergency planning activities will include the following (which are the responsibility of the SSO and/or the FOL):

- Coordinating with local Emergency Response personnel to ensure that TtNUS emergency action activities are compatible with existing emergency response procedures. Base Fire Protection and Emergency Services will be notified of scheduled events and activities. This is most imperative in situations where their services may be required.
- Establishing and maintaining information at the project staging area (Support Zone) for easy access in the event of an emergency. This information will include the following:
 - Chemical Inventory of chemicals used onsite, with Material Safety Data Sheets.
 - Onsite personnel medical records (Medical Data Sheets – Attachment II)
 - A log book identifying personnel onsite each day.
 - Hospital route maps with directions (these should also be placed in each site vehicle).
 - Emergency Notification - phone numbers.

The TtNUS FOL will be responsible for the following tasks:

- Identifying a chain of command for emergency action.
- Educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible.
- Anomaly avoidance techniques will be used for all intrusive surface soil and subsurface soil activities. It is understood that the use of two-way communication devices (cellular phones and radios) may be used at the NSA Crane, providing such equipment is intrinsically safe.
- Periodically performing practice drills to ensure site workers are familiar with incidental response measures.
- Providing the necessary equipment to safely accomplish identified tasks.

2.3 EMERGENCY RECOGNITION AND PREVENTION

2.3.1 Recognition

Emergency situations that may be encountered during site activities will generally be recognized by visual observation. To adequately recognize chemical exposures, site personnel must have a clear knowledge of signs and symptoms of exposure associated with site contaminants. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended control methods are discussed in

detail in Sections 5.0 and 6.0. Additionally, early recognition of hazards will be supported by daily site surveys to eliminate any situation predisposed to an emergency. MPPEH will be avoided. If suspect MEC/MPPEH are discovered, the location will be recorded and NSA Crane site contact, Thomas Brent, will be notified. Survey findings will be documented by the FOL and/or the SSO in the Site Health and Safety log book, however, site personnel will be responsible for reporting hazardous situations. Where potential hazards exist, TtNUS will initiate control measures to prevent adverse effects to human health and the environment.

The above actions will provide early recognition for potential emergency situations, and allow TtNUS to initiate the necessary control measures.

2.3.2 Prevention

TtNUS personnel will minimize the potential for emergencies by following the TtNUS Health and Safety Guidance Manual and ensuring compliance with the HASP and applicable OSHA regulations. Daily site surveys of work areas, prior to the commencement of that day's activities, by the FOL or the SSO will also assist in prevention of illness/injuries when hazards are recognized early and control measures initiated.

2.4 EVACUATION ROUTES, PROCEDURES, AND PLACES OF REFUGE

An evacuation will be initiated whenever recommended hazard controls are insufficient to protect the health, safety or welfare of site workers. Specific examples of conditions that may initiate an evacuation include, but are not limited to the following: severe weather conditions; fire or explosion; monitoring instrumentation readings which indicate levels of contamination are greater than instituted action levels; and evidence of personnel overexposure to potential site contaminants.

In the event of an emergency requiring evacuation, personnel will immediately stop activities and report to the designated safe place of refuge unless doing so would pose additional risks. When evacuation to the primary place of refuge is not possible, personnel will proceed to a designated alternate location and remain until further notification from the TtNUS FOL. Safe places of refuge will be identified prior to the commencement of site activities by the SSO and will be conveyed to personnel as part of the pre-activities training session. This information will be reiterated during daily safety meetings. Whenever possible, the safe place of refuge will also serve as the telephone communications point for that area. During an evacuation, personnel will remain at the refuge location until directed otherwise by the TtNUS FOL or the on-site Incident Commander of the Emergency Response Team. The FOL or the SSO will perform a head count at this location to account for and to confirm the location of site personnel. Emergency response personnel will be immediately notified of any unaccounted personnel. The SSO will document

the names of personnel onsite (on a daily basis) in the site Health and Safety Logbook. This information will be utilized to perform the head count in the event of an emergency.

Evacuation procedures will be discussed during the pre-activities training session, prior to the initiation of project tasks. Evacuation routes from the site and safe places of refuge are dependent upon the location at which work is being performed and the circumstances under which an evacuation is required. Additionally, site location and meteorological conditions (i.e., wind speed and direction) may dictate evacuation routes. As a result, assembly points will be selected and communicated to the workers relative to the site location where work is being performed. Evacuation should always take place in an upwind direction from the site.

2.5 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

TtNUS personnel will be working in close proximity to each other at NSA Crane. As a result, hand signals, cell-phone (when service is available), voice commands, and line of site communication will be sufficient to alert site personnel of an emergency. When project tasks are performed simultaneously on different sites, vehicle horns will be used to communicate emergency situations. If an emergency warranting evacuation occurs, the following procedures are to be initiated:

- Initiate the evacuation via cell-phone, hand signals, voice commands, line of site communication, or vehicle horns. The following signals shall be utilized when communication via vehicle horn is necessary:

HELP	three short blasts	(. . .)
EVACUATION	three long blasts	(- - -)

- Report to the designated refuge point.
- Once non-essential personnel are evacuated, appropriate response procedures will be enacted to control the situation.
- Describe to the FOL (FOL will serve as the Incident Coordinator) pertinent incident details.

In the event that site personnel cannot mitigate the hazardous situation, the FOL and SSO will enact emergency notification procedures to secure additional assistance in the following manner:

Dial 911 (outside services) and call other pertinent emergency contacts listed in Table 2-1 and report the incident. Give the emergency operator the location of the emergency, the type of emergency, the number

of injured, and a brief description of the incident. Stay on the phone and follow the instructions given by the operator. The operator will then notify and dispatch the proper emergency response agencies.

2.6 EMERGENCY CONTACTS

Prior to initiating field activities, site personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an accident. Table 2-1 provides a list of emergency contacts and their associated telephone numbers. This table must be posted where it is readily available to site personnel. Facility maps should also be posted showing potential evacuation routes and designated meeting areas.

TABLE 2-1
EMERGENCY CONTACTS
NSA Crane

CONTACT	TELEPHONE
Base Emergency Number (Fire Department, Base Security, Ambulance) <ul style="list-style-type: none"> • If dialing from an on-base phone..... • If dialing from cell or off-base phone..... 	854-3300 or 854-1333 911
Base Environmental Office	(812) 854-3114
Bedford Ambulance	(812) 279-6545
Bloomington Hospital (Bloomington, IN)	(812) 336-9515
Hospital, Bedford Medical Center (Bedford, IN)	(812) 275-1200
Sullivan County Community Hospital (hospital closest to Dugger Lake location)	(812) 268-4311 ext 2171/2172
Poison Control Center	(800) 222-1222
National Response Center	(800) 424-8802
Base Contact Thomas Brent	(812) 854-6160
Project Manager Rick Barringer	(412) 921-8524
UXO Manager Ralph Brooks	(770) 413-0965
TtNUS Crane Field Office Building 3245/ Field Operations Leader	(812) 854-0280
TtNUS Pittsburgh Office	(412) 921-7090
CLEAN Health and Safety Manager, Matthew M. Soltis, CIH, CSP	(412) 921-8912
TtNUS Project Safety Officer Jennifer Carothers, PhD	(412) 921-8083
TtNUS Site Safety Officer TBD	---

2.7 EMERGENCY ROUTE TO HOSPITAL

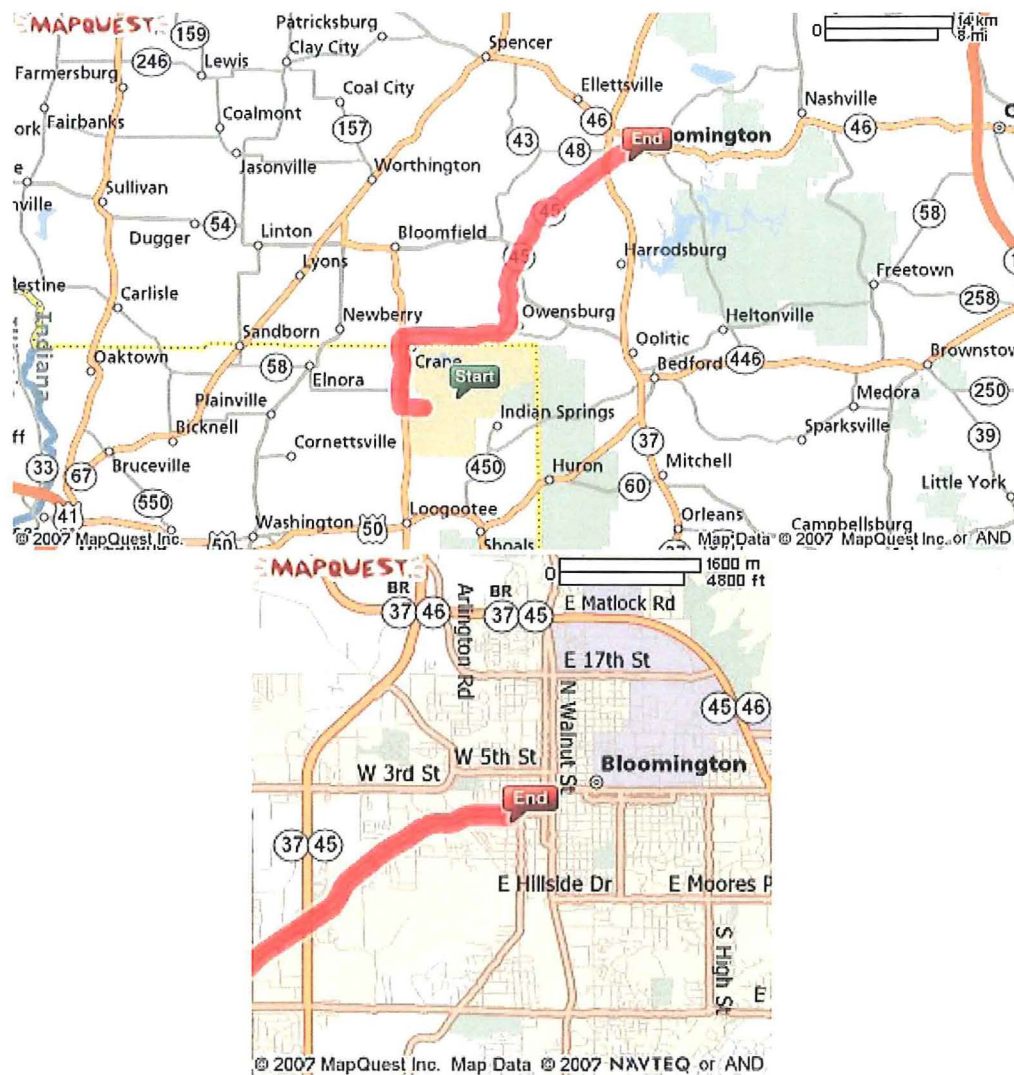
Directions to the Bloomington Hospital:

601 W. 2nd St.
P.O. Box 1149
Bloomington, IN 47402

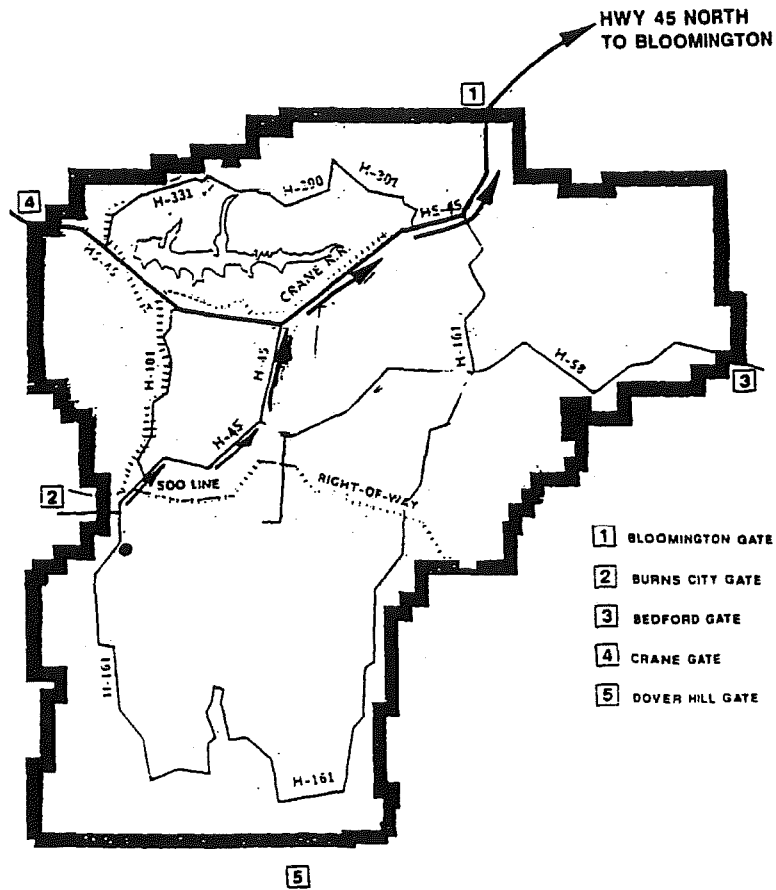
Exit NSA Crane on H-45 through the Bloomington Gate. Follow Highway 45 North to Bloomington at Highway 45 and Highway 37. Continue going straight over the overpass (Bloomfield Road). Follow Bloomfield Road North; this road turns into 2nd Street. Follow 2nd Street, hospital will be on the right (601 West 2nd Street)

**FIGURE 2-1
MAPS TO
BLOOMINGTON HOSPITAL ROUTE MAP (BLOOMINGTON GATE)**

****Note: The Bloomington Gate is open 24 hours.**



ROUTE TO BLOOMINGTON HOSPITAL



Directions to Bedford Medical Center:*

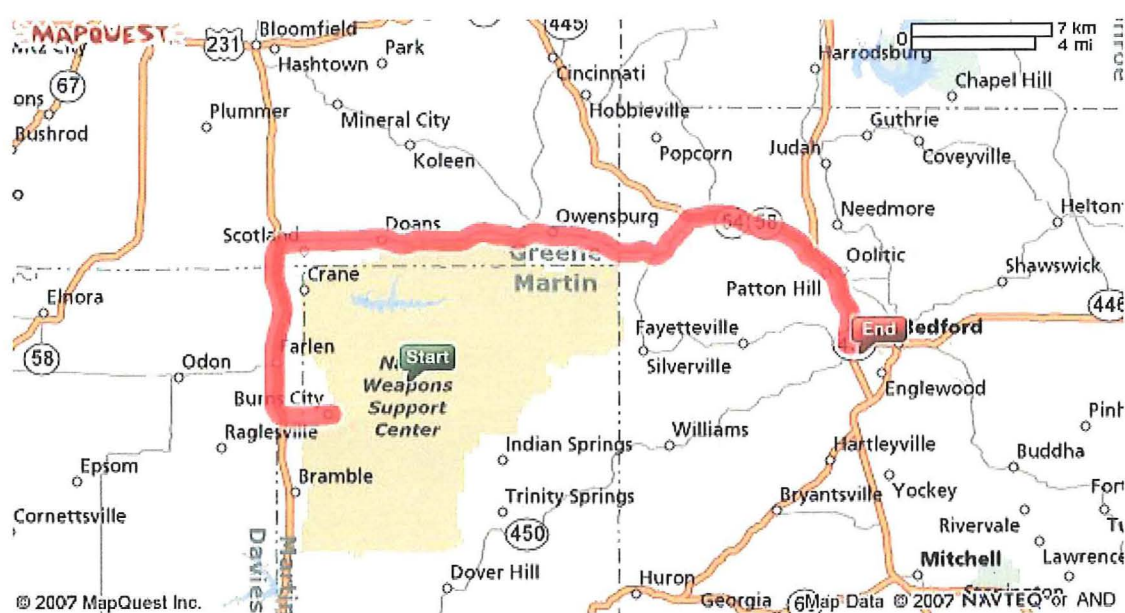
2900 16th Street
Bedford, IN 47421

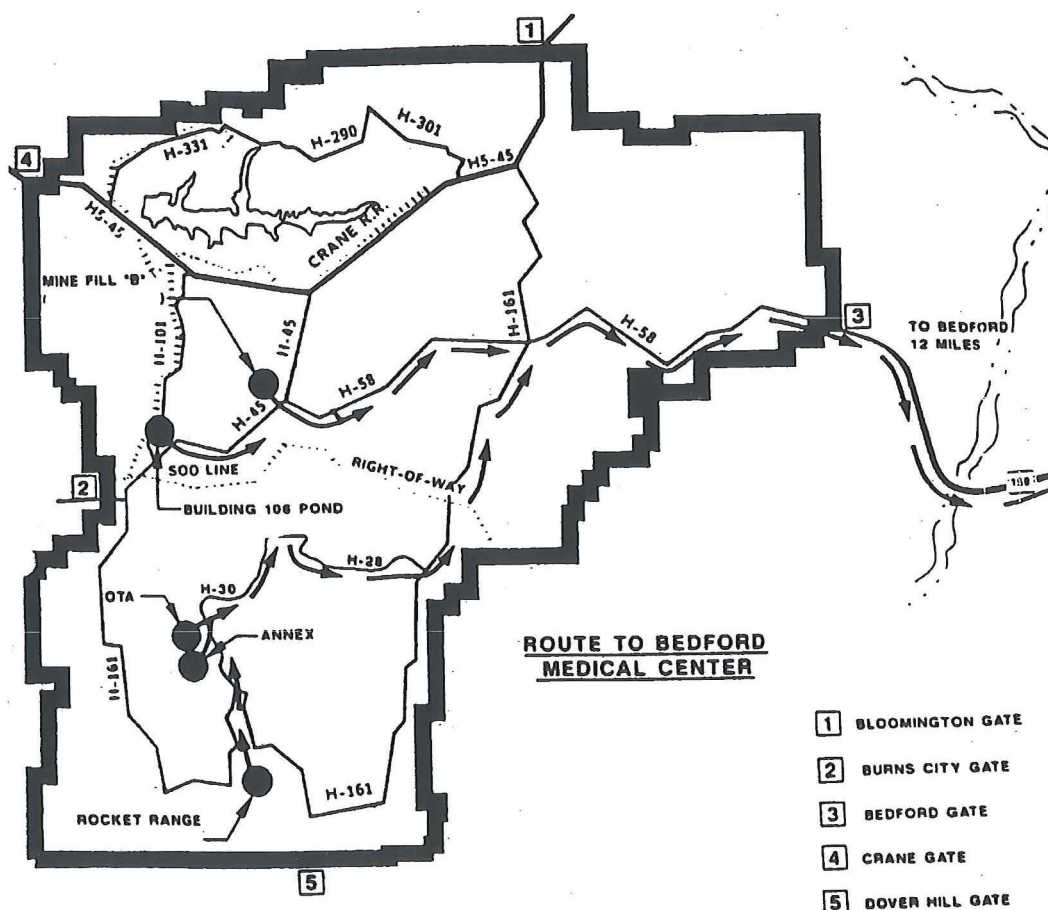
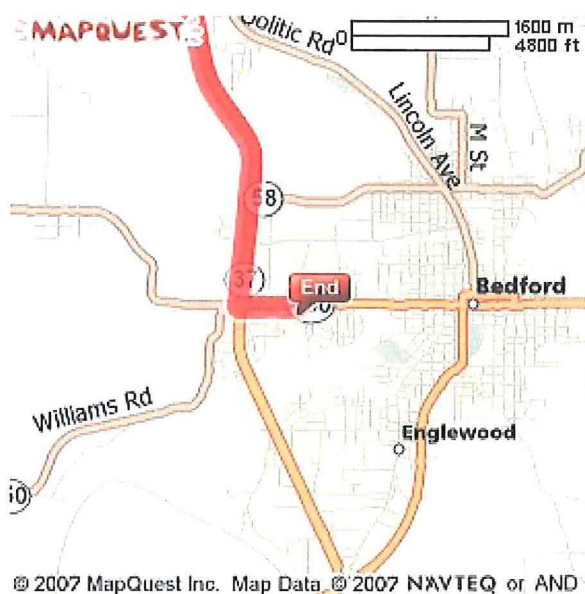
Exit the base on H-58, through the Bedford Gate. Head West on State Highway 158. State Highway 158 becomes 16th Street upon entering the City of Bedford. The medical center is on the right shortly after Plaza Drive.

***NOTE:** The Bedford Gate is open only from 0600 - 0830 and 1500 - 1800 hours, whereas the Bloomington Gate is open 24 hours. A map indicating the travel route from the site to the hospitals are included as Figures 2-2.

FIGURE 2-2
MAPS TO
BEDFORD MEDICAL CENTER ROUTE MAP (BEDFORD GATE)

***Note:** The Bedford Gate is open only from 0600 - 0830 and 1500 - 1800 hours.





Sullivan County Community Hospital (hospital closest to Dugger Lake location)
 2200 North Section Street
 Sullivan, IN 47882
 812-268-4311

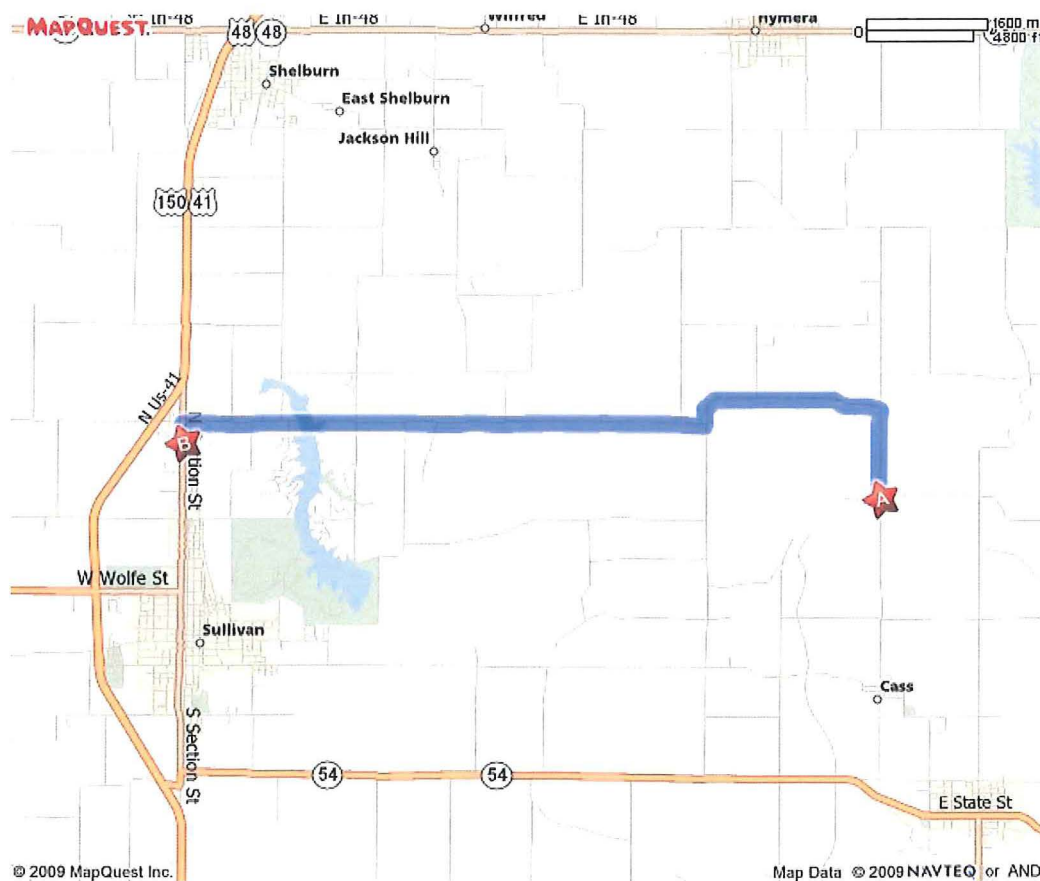
Directions to Sullivan Hospital:

Total Time: 17 minutes
 Total Distance: 8.35 miles

A: N County Road 700 E & E County Road 225 N, Sullivan, IN 47882

- | | | |
|----|---|--------|
| 1: | Start out going EAST on N CR-700 E toward E CR-325 N. | 0.9 mi |
| 2: | Turn LEFT onto E CR-325 N. | 1.8 mi |
| 3: | E CR-325 N becomes N CR-525 E. | 0.2 mi |
| 4: | Turn RIGHT onto E CR-300 N. | 3.5 mi |
| 5: | E CR-300 N becomes E 300 NORTH. | 1.7 mi |
| 6: | Turn LEFT onto N SECTION ST. | 0.2 mi |
| 7: | End at 2200 N Section St Sullivan, IN 47882 | |

B: Sullivan County Community Hosp: 2200 N Section St, Sullivan, IN 47882



As soon as possible, the NSA Crane site contact Thomas Brent must be informed of any incident or accident that requires medical attention.

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical services personnel. This information is listed on Medical Data Sheets filed onsite. If an exposure to hazardous materials has occurred, provide hazard information from Table 6-1 to medical service personnel.

2.8 PPE AND EMERGENCY EQUIPMENT

A first-aid kit, eye wash units (or bottles of disposable eyewash solution) and fire extinguishers (strategically placed) will be maintained onsite and shall be immediately available for use in the event of an emergency. This equipment will be located in the field office as well as in each site vehicle. At least one first aid kit supplied with equipment to protect against bloodborne pathogens will also be available on site. Personnel identified within the field crew with bloodborne pathogen and first-aid training will be the only personnel permitted to offer first-aid assistance. In addition, due to the fact that the nearest hospital/medical center is over 4 minutes away, a CPR/First Aid trained personnel must be on-site at all times during the times work is being conducted.

2.9 DECONTAMINATION PROCEDURES / EMERGENCY MEDICAL TREATMENT

During any site evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. Decontamination will not be performed if the incident warrants immediate evacuation. However, it is unlikely that an evacuation would occur which would require workers to evacuate the site without first performing the necessary decontamination procedures.

TtNUS personnel will perform rescue operations from emergency situations and may provide initial medical support for injury/illnesses requiring only "Basic First-Aid" level support, and only within the limits of training obtained by site personnel. Basic First-Aid is considered treatment that can be rendered by a trained first aid provider at the injury location and not requiring follow-up treatment or examination by a physician (for example; minor cuts, bruises, stings, scrapes, and burns). Not included as Basic First-Aid are second or third degree burns, cuts, lacerations requiring stitches or butterfly bandaging, heat exhaustion, severe poisonous plant or insect bite reactions. Personnel providing medical assistance are required to be trained in First-Aid and in the requirements of OSHA's Bloodborne Pathogen Standard (29 CFR 1910.1030). Medical attention above First-Aid level support will require assistance from the designated emergency response agencies. Attachment I provides the procedure to follow when reporting an injury/illness, and the form to be used for this purpose. **If the emergency involves personnel exposures to chemicals, follow the steps provided in Figure 2-3.**

2.10 INJURY/ILLNESS REPORTING

If any TtNUS personnel are injured or develop an illness as a result of working on site, the TtNUS "Injury/Illness Procedure" (Attachment I) must be followed. Following this procedure is necessary for documenting of the information obtained at the time of the incident.

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical services personnel. This information is listed on Medical Data Sheets filed onsite. If an exposure to hazardous materials has occurred, provide information on the chemical, physical, and toxicological properties of the subject chemical(s) to medical service personnel.

FIGURE 2-3**POTENTIAL EXPOSURE PROTOCOL**

The purpose of this protocol is to provide guidance for the medical management of injury situations.

In the event of a personnel injury or accident:

- Rescue, when necessary, employing proper equipment and methods.
- Give attention to emergency health problems -- breathing, cardiac function, bleeding, and shock.
- Transfer the victim to the medical facility designated in this HASP by suitable and appropriate conveyance (i.e. ambulance for serious events)
- Obtain as much exposure history as possible (a Potential Exposure report is attached).
- If the injured person is a Tetra Tech NUS employee, call the medical facility and advise them that the patient(s) is/are being sent and that they can anticipate a call from the WorkCare physician. WorkCare will contact the medical facility and request specific testing which may be appropriate. WorkCare physicians will monitor the care of the victim. Site officers and personnel should not attempt to get this information, as this activity leads to confusion and misunderstanding.
- Call WorkCare at 1-800-455-6155 and enter Extension 109, being prepared to provide:
 - Any known information about the nature of the injury.
 - As much of the exposure history as was feasible to determine in the time allowed.
 - Name and phone number of the medical facility to which the victim(s) has/have been taken.
 - Name(s) of the involved Tetra Tech NUS, Inc. employee(s).
 - Name and phone number of an informed site officer who will be responsible for further investigations.
 - Fax appropriate information to WorkCare at (714) 456-2154.
- Contact Corporate Health and Safety Department (Matt Soltis) and Human Resources (Marilyn Duffy) at 412-921-7090

As data is gathered and the scenario becomes more clearly defined, this information should be forwarded to WorkCare.

WorkCare will compile the results of the data and provide a summary report of the incident. A copy of this report will be placed in each victim's medical file in addition to being distributed to appropriately designated company officials.

Each involved worker will receive a letter describing the incident but deleting any personal or individual comments. A personalized letter describing the individual findings/results will accompany this generalized summary. A copy of the personal letter will be filed in the continuing medical file maintained by WorkCare.

FIGURE 2-3 (continued)

WORKCARE POTENTIAL EXPOSURE REPORT

Name: _____ Date of Exposure: _____

Social Security No.: _____ Age: _____ Sex: _____

Client Contact: _____ Phone No.: _____

Company Name: _____

I. Exposing Agent

Name of Product or Chemicals (if known): _____

Characteristics (if the name is not known)

Solid Liquid Gas Fume Mist Vapor

II. Dose Determinants

What was individual doing? _____

How long did individual work in area before signs/symptoms developed? _____

Was protective gear being used? If yes, what was the PPE? _____

Was their skin contact? _____

Was the exposing agent inhaled? _____

Were other persons exposed? If yes, did they experience symptoms? _____

III. Signs and Symptoms (check off appropriate symptoms)**Immediately With Exposure:**

Burning of eyes, nose, or throat

Tearing

Headache

Cough

Shortness of Breath

Chest Tightness / Pressure

Nausea / Vomiting

Dizziness

Weakness

Delayed Symptoms:

Weakness

Nausea / Vomiting

Shortness of Breath

Cough

Loss of Appetite

Abdominal Pain

Headache

Numbness / Tingling

IV. Present Status of Symptoms (check off appropriate symptoms)

Burning of eyes, nose, or throat

Tearing

Headache

Cough

Shortness of Breath

Chest Tightness / Pressure

Cyanosis

Nausea / Vomiting

Dizziness

Weakness

Loss of Appetite

Abdominal Pain

Numbness / Tingling

Have symptoms: (please check off appropriate response and give duration of symptoms)

Improved: _____ Worsened: _____ Remained Unchanged: _____

V. Treatment of Symptoms (check off appropriate response)

None: _____ Self-Medicated: _____ Physician Treated: _____

3.0 SITE BACKGROUND

3.1 SITE HISTORY AND BACKGROUND

NSA Crane is located in Crane, Indiana, approximately 75 miles southwest of Indianapolis and 71 miles northwest of Louisville, Kentucky. The facility encompasses more than 100 square miles (64,463 acres) in Davies, Greene, Lawrence, and Martin Counties. It is located in a rural, sparsely populated area. The acreage surrounding the Base is either wooded or farmed land. The facility, originally called Naval Ammunition Depot (NAD), Burns City, was opened in 1941 to serve as an inland ammunition production and storage center. The Depot's name was changed to NAD, Crane in 1943. In 1975, the name was changed to Naval Weapons Support Center, Crane and in 1992, the name was again changed to Naval Surface Warfare Center, Crane. In 2009, the name was changed to Naval Support Activity Crane. Today NSA Crane's mission is to "provide quality and responsive engineering, technical and material support to the Fleet for combat subsystems, equipment and components, microelectronic technology, microwave components, electronic warfare, acoustic sensors tests, engineering pyrotechnics, small arms, electronic module test and system command." Under the Single Service Management Program, a segment of the Center's mission is to provide support (including environmental protection) to the Crane Army Ammunition Activity (CAAA). The Army is tasked with the production and renovation of conventional ammunition and related items, the performance of manufacturing, engineering, and product quality assurance to support production; and the storage, shipment, demilitarization, and disposal of conventional ammunition and related components. Because of the nature of the Army's operations, CAAA contributes significant financial support for the environmental program through an Inter-service Support Agreement.

Sampling will occur at five locations on Base (one water-based site, four land-based sites). Each site and the possibility of encountering MEC are discussed below.

3.1.1 Land-based Sites

The investigation will focus on characterizing the surface soil materials for the various MC groups described for each location. Although remote, because there is the potential to encounter UXO or MEC, UXO Technicians will be present to support the sampling effort. UXO-surface surveys will be performed to avoid contacting potential site MEC/MPPEH. No geophysics surveys are planned for these land-based MRP sites.

AOC-1 B143 Drop Test Area

Very limited confirmation sampling will be conducted to address the area of the former drop tower and concrete pad (0.06 acre) about a 50-ft by 50-ft area used to drop test Mk 118, Mod 0 Rockeye Bomblets

from 1969 through 1980. The tower, concrete pad and some soil were removed from the site. A surface depression now exists at the former drop test site. The Mk 118, Mod 0 Rockeye Bomblets are about 13.5 inches long and just over two inches in diameter. An inert bomblet, containing a live fuze, but no main explosive charge, was used for reliability testing and establishing delivery tactics. It has been assumed (Malcolm Pirnie, 2005, Final Preliminary Assessment Naval Surface Warfare Center Crane Divisions, IN, April) that only inert bombs with live fuzes were tested at the B-143 Drop Test Area due to the close proximity of buildings and interviews with site personnel (Section 5.1.3, PA Report).

No evidence of MEC/MPPEH was observed on the surface at the site. There is no documentation of MEC removals at the site, and the activity was performed on a concrete pad. The PA Report indicated that the B143 Drop Test Area is not suspected to contain MEC. The concrete pad, soils, and any potential debris were removed. Possible MCs at the B-143 Drop Test Area include metals, lead azide, tetryl, Composition B, and Octol.

Heavy metals would be present in the Rockeye Bomblet casing, and the Octol (170 grams) or Composition B (181 grams) would be present in the explosive component of the Rockeye Bomblet. The booster is 5 grams of tetryl, and the base fuze element is less than 1 gram of lead azide. Octol is a mix of Cyclotetramethylenetetranitramine (75%) and Trinitrotoluene (TNT) (25%). It is a solid buff colored, castable explosive used in high explosive shells and as the filler for bombs. Composition B is a mixture of Hexahydro-Trinitro-Triazine (RDX), TNT, and beeswax. Composition B contains 60% RDX and 40% TNT, exclusive of wax and is an authorized munitions filler for Navy standard aircraft bombs, mines, torpedoes, antitank artillery shells, demolition charges, and in rockets. However, the drop testing items would not contain the main explosive charge of Comp. B or Octol. Due to the remote possibility that there may be residual MEC in the depressed area, UXO Technicians will be present to support the sampling effort (UXO avoidance).

AOC-2 Pyro Area Outside Test Burn Pad

The Pyro Area Outside Test Burn Pad MRP site consists of a 0.002-acre outdoor test area which covers two non-contiguous areas, each measuring about 6-ft by 6-ft. This location was used to test pyrotechnics (flares, signals, smoke screens) behind Building 126 from 1984 through 1985. Pyrotechnic testing occurred both inside Building 126 and also inside two open square concrete outdoor testing basins behind Building 126. The concrete basins were noted to be in poor condition and were used for burning pyrotechnics and testing. Smoke chemicals include zinc oxide, sulfur, sodium hydrogen carbonate, sodium chloride, and potassium chlorate, in addition to heavy metals. Photoflash and spotting charges include magnesium, aluminum, potassium perchlorate, and barium nitrate.

No evidence of MEC/MPPEH was observed at the site. However, MEC may potentially be buried inside the concrete testing basins. The PA Report indicated that the concrete testing basins are suspected to contain MEC. There may also be ash/debris in the basins that may require removal. Sampling in the areas should include the immediate vicinity of the basins and soil samples from below the bottom of the basin if the concrete bottoms are not intact. Due to the potential for residual MEC in the basins, UXO Technicians will be present to support the sampling effort (UXO avoidance).

UXO-6 Test Pads Behind Building 198

The test pads on the hill behind Building 198 MRP site consists of two 0.01-acre test pads (each covering about 21-ft by 21-ft) used from 1983 through 1985 for the development and testing of safe disposal methods for various types of dyes.

NSA Crane personnel developed and tested an item constructed of a 2.75-inch warhead that functioned through the use of a blasting cap detonating a C-4 booster, which then detonated a Baratol imploding charge. The imploding charge sublimed test dye pellets that were contained within the warhead that formed a colored smoke cloud. M18 smoke grenades were also reportedly tested at this site. No evidence of MEC/MPPEH was observed at the site. The PA Report indicated that the Test Pad areas are suspected to contain MEC.

MC associated with the types of munitions known to have been used at the Test Pads on the Hill Behind B-198 include TNT, baratol, and C-4, as well as other non-explosives materials such as fluorescent dye, solvent 33 yellow dye, and methyl-amino-anthraquinone. In addition to these listed MC, other chemicals may have been used in the experimental testing occurring at the Test Pads on Hill Behind B-198 that included items such as metals, 1,2 naphthaquinone, antimony oxide, citric acid, dextrin, lead nitrate, and vanadium pentoxide. Due to the remote possibility that there may be residual MEC in the test pad areas, UXO Technicians will be present to support the sampling effort (UXO avoidance).

West Gate Small Arms Range

The West Gate Small Arms Range Complex is located outside of the western gate of NSA Crane on Navy property. The site consists of 4 different ranges, a 500-yard Rifle Range, a 60-yard Pistol range, a Skeet Range, and a Trap Range, because of the overlapping and contiguous site boundaries, these areas are being combined into one MRP site.

3.1.2 Water-based Site

Due to the nature of the MCs and the time frame for some of these testing activities, MCs are not anticipated to be detectable in the water column in the water-based site. Therefore the investigation will focus on characterizing the lake bottom sediment for the various MC groups described below. The potential for encountering MEC in the lake sediment is remote. However, a UXO Technician will be part of the sampling team to ensure that no MEC are present in the lake-bottom sediment collected for sampling and analysis. For sites where Navy-specific dyes may be MCs of interest, samples will be collected and sent to the Navy laboratory at NSA Crane to perform specialized analytical dye tests.

AOC-4 Lake Oberlin

Lake Oberlin has been estimated to have been used in the mid- to late-1950s for testing submarine flotation flares and fluorescene-dye man-overboard markers. The 50-meter long dam is located on the southern edge of Lake Oberlin which covers approximately 3 acres and is estimated to have a maximum depth of 15 feet.

The 3.0-acre lake is currently used by the Boy Scouts for recreational boating and fishing. There is minimal probability that MEC/MPPEH is present in the sediment at the site as a result of partially consumed flares and their associated components settling to the bottom of the lake. There is a minimal probability that MC is present at the site because of the minimal amounts of MC associated with the items. No evidence of MEC/MPPEH or MC were observed at the site. While it is not expected that MEC remain at the lake, the WAMS indicated that the entire lake was suspect for MEC.

The PA team was unable to locate specific records of the types and quantities of pyrotechnics tested at Lake Oberlin. Interviews with installation personnel indicated fluorescene dye testing from a signaling pistol; and an historic report indicates that submarine flotation flares were also tested at Lake Oberlin. It is expected that the following munitions may be found on site:

- Submarine Flotation Flares
- Fluorescene Dye Markers

No records were located to indicate specific types of submarine flotation flares tested at Lake Oberlin. An example of a submarine flotation flare would be a Submarine Float Signal Mark (MK) 2 Mod. 2. The submarine flotation flares are pyrotechnics and contain smoke composition as the filler. The Submarine Float Signal MK2 Mod. 2 is a signaling device designed to be launched from a maximum depth of 285 feet to produce a red, black, green, or yellow smoke display on the surface. The flares consist of a cartridge with an aluminum sleeve. Additional technical information about this ordnance type is included in

Appendix D of the PA (Malcolm Pirnie, April 2005). No records were located to indicate the specifics of the fluorescene dye markers tested at Lake Oberlin. A similar example to the fluorescene dye markers would be a Marine Illumination Signal, MK2. The Marine Illumination Signals are pyrotechnics and contain smoke composition as the filler. The Marine Illumination Signals are designed to be fired from a Pyrotechnic Pistol, MK 5 either from the surface or from aircraft, primarily as a distress signal. It displays a red, green, or white star with a burning time of approximately 6 seconds at an altitude of roughly 200 feet above the point of launching. The markers consist of a cartridge with an aluminum sleeve. Additional technical information about this ordnance type is included in Appendix D of the PA (Malcolm Pirnie, April 2005).

The Submarine Float Signal (MK2 Mod. 2) and Marine Illumination Signal (MK2) contain smoke composition as the filler. Potential MC associated with the smoke filler may include a combination of various chemicals that are contained in burning-type colored smoke munitions and explosive-type colored smoke munitions. Some chemicals used in typical smoke compositions include zinc oxide, sulfur, sodium hydrogen carbonate, sodium chloride, and potassium chlorate. A UXO Technician will be aboard the sampling craft to verify that no suspect MEC/MPPEH items are present in lake-bottom sediment collected in the sampling device.

4.0 SCOPE OF WORK

This section describes the project tasks that will be performed at NSA Crane. Additionally, each task has been evaluated and the associated hazards and recommended control measures are listed in the Accident Prevention Plan and Activity Hazard Analysis in Attachment IV of this HASP. The planned activities involved in this effort are presented in detail in the Work Plan developed for the project. If new tasks are to be performed at the site, the Accident Prevention Plan and Activity Hazard Analysis and this section will be modified accordingly.

Seven sites will be sampled during this investigation (four water-based sites, three land-based sites). The sites to be addressed during this field work were munitions drop test sites, pyrotechnics and signaling device test areas (water sites), and pyrotechnics burn pits. High explosive MEC is not anticipated at these locations. This is primarily a non-intrusive sampling/characterization effort and a UXO Technician will be present to evaluate suspect MEC/MPPEH hazards, if present.

MEC/anomaly avoidance field procedures will be practiced for the field investigation activities being performed by TtNUS. Specific tasks to be conducted include the following:

- Mobilization and demobilization
- UXO avoidance.
 - Land sites will be surface surveyed by UXO Technicians to confirm that MEC/MPPEH hazards are not present in the areas to be sampled.
- Soil sampling via trowels and hand augering
 - Field screening of soil samples will be performed using an X-ray fluorescence instrument in the field to guide sample collection for laboratory analysis
- Sediment sampling
 - Sampling at the water-based site will be limited to the lake bottom sediment and will be performed from a boat using petite sonar dredge device (or similar small clam shell type sampler). A UXO technician will be onboard to verify that no suspect MEC/MPPEH materials were included in the dredged sediment recovered from the lake bottoms.
- Decontamination
- IDW management

The above listing represents a summarization of the tasks as they apply to the scope and application of this HASP. For more detailed description of the associated tasks, please refer to the Site-Specific Work Plan. If additional tasks are determined to be necessary, this HASP will be amended and a hazard evaluation of the additional tasks performed.

5.0 IDENTIFYING AND COMMUNICATING TASK-SPECIFIC HAZARDS AND GENERAL SAFE WORK PRACTICES

The purpose of this section is to identify the anticipated hazards and appropriate hazard prevention/hazard control measures that are to be observed for each planned task or operation. These topics have been summarized for each planned task through the use of task-specific Activity Hazard Analysis which are to be reviewed in the field by the SSO with all task participants prior to initiating any task. Additionally, potential hazard and hazard control matters that are relevant but are not necessarily task-specific are addressed in the following portions of this section.

Section 6.0 presents additional information on hazard anticipation, recognition, and control relevant to the planned field activities.

5.1 GENERAL SITE SAFE WORK PRACTICES

In addition to the task-specific work practices and restrictions identified in the SWPs attached to this HASP, the following general safe work practices are to be followed when conducting work on-site.

- Avoid contact with potential MEC or MPPEH by avoiding metallic objects and following the instructions of the UXO Technicians.
- Eating, drinking, chewing gum or tobacco, taking medication, or smoking in contaminated or potentially contaminated areas or where the possibility for the transfer of contamination exists is prohibited.
- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area. If a source of potable water is not available at the work site that can be used for hands-washing, the use of waterless hands cleaning products will be used, followed by actual hands-washing as soon as practicable upon exiting the site.
- Avoid contact with potentially contaminated substances including puddles, pools, mud, or other such areas. Avoid, kneeling on the ground or leaning or sitting on equipment. Keep monitoring equipment away from potentially contaminated surfaces.
- Plan and mark entrance, exit, and emergency evacuation routes.
- Rehearse unfamiliar operations prior to implementation.

- Buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity to assist each other in case of emergency.
- Establish appropriate safety zones including support, contamination reduction, and exclusion zones.
- Minimize the number of personnel and equipment in contaminated areas (such as the exclusion zone). Non-essential vehicles and equipment should remain within the support zone.
- Establish appropriate decontamination procedures for leaving the site.
- Immediately report all injuries, illnesses, and unsafe conditions, practices, and equipment to the SSO.
- Observe co-workers for signs of toxic exposure and heat or cold stress.
- Inform co-workers of potential symptoms of illness, such as headaches, dizziness, nausea, or blurred vision.

5.2 MEC/MEC RELATED ITEMS SAFE WORK PRACTICES

One of the obvious hazards associated with this activity is the potential for encountering MEC. The unintended detonation of MEC or a MEC related item could result in injury or possibly death.

MEC represents a potential safety hazard at this site and may constitute an imminent and substantial endangerment to personnel and the local populations due to its explosive potential. All activities involving work in areas potentially containing MEC hazards shall be conducted with approval from the Naval Ordnance Safety and Security Activity (NOSSA) and in accordance with OPNAV 8020.15, NAVSEA Operations Pamphlet (OP) 5, NOSSAINST 8020.15, and DOD 6055.9-Std., and all other DoN and DOD requirements regarding personnel, equipment, and procedures. The contractor will perform all work in accordance with the approved Explosives Safety Submission (ESS) Determination per NOSSAINST 8020.15.

To address MEC hazards, the following measures will be incorporated.

5.2.1 General MEC Avoidance Measures

TiNUS Unexploded Ordnance (UXO) Support will perform a visual detector-aided survey of the land areas the Site Inspection Team will enter. During the pre-planning phase of the visit the team will identify the areas they wish to inspect.

- Site personnel will follow instructions and directions provided by the UXO Technician.
- Site personnel will restrict themselves to the areas identified by UXO personnel.
- Personnel will be assigned in such a manner to permit the direct visual observation of one another as well as provide any emergency assistance should it be required.
- Personnel will notify the UXO Technician should they encounter suspect MEC/MPPEH articles or unidentified items.
- Smoking is prohibited on site.
- Matches, lighters, or other fire, flame, or spark-producing devices are prohibited the site.
- Cell phones or two-way radios will be only be used under the direct supervision and expressed permission of the UXO Technician
- Personnel shall suspend outdoor activities in the event of inclement weather (thunderstorms, lightning, heavy rain).

5.2.2 Surface Soil Sampling Measures

Surface soil samples are normally collected at depths from zero to 6 inches below ground surface. The following paragraphs describe anomaly avoidance procedures for soil sampling between zero and 6 inches below ground surface on a site with known or suspected MEC.

- The UXO Technician must conduct an access survey of the routes to and from the proposed investigation site as well as an area around the investigation site.
- The UXO Technician must visually survey the surface of each proposed surface soil sampling site for any indication of MEC or MC impact.

- The UXO technician must conduct a survey of the proposed sampling locations using geophysical instruments capable of detecting the smallest known or anticipated military munitions to a depth of 1 foot.
- If anomalies are detected at a proposed sampling location or too many anomalies are detected in a general area of interest, an alternate location for collection of surface soil samples will be selected.
- Detected anomalies will be prominently marked with survey flagging or pin flags for avoidance during sampling activities.

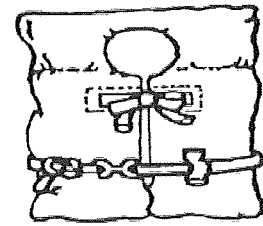
5.3 SAFE BOATING PRACTICES

When working out of a boat, USCG-approved personal flotation devices (PFD) will be used. Due to the obvious hazards associated with working on or near the water's edge during inclement weather, field activities may be temporarily suspended or terminated at the discretion and direction of the FOL or SSO.

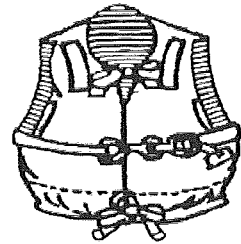
The purpose of a personal flotation device, commonly referred to as a life jacket, is to provide additional buoyancy to help you float. Buoyancy is the force required to keep you afloat with your head and chin above water. This force is expressed in pounds. Several factors affect the amount of buoyancy that a person may need to float. These factors include size, weight, lung size, age, percent of body fat and a person's physical condition. Because of these varying factors, it is best to try your personal flotation device in the water before an actual emergency occurs to ensure that it will keep you afloat. Shown below are the different types of PFDs.

Type I

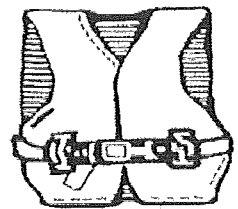
This is the easiest PFD to pull on in an emergency and is designed for extended survival in rough, open water. It usually will turn an unconscious person face-up and has 22 pounds of buoyancy. This is the best PFD to keep you afloat in remote regions where rescue may be slow in coming.

**Type II**

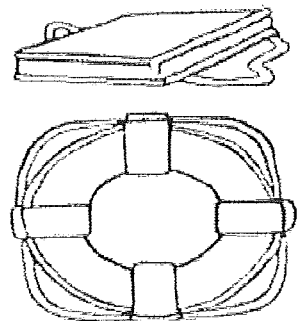
This "classic" PFD comes in several sizes for adults and children and is for calm inland water where there is a chance of fast rescue. It is less bulky and less expensive than a Type 1, and may turn an unconscious person face-up in the water. It has 15.5 pounds of buoyancy.

**Type III**

These lifejackets are generally considered the most comfortable, with styles for different boating activities and sports. They are for use in calm water where there is a good chance of fast rescue since they will generally not turn an unconscious person face-up. Flotation aids come in many sizes and have a minimum buoyancy of 15.5 pounds.

**Type IV (throwable)**

These are designed to be thrown to a person in the water. Throwable devices include boat cushions, ring buoys, and horseshoe buoys. They are not designed to be worn and should be supplemented by a PFD. It is important to keep these devices easily accessible for emergencies, and they should not be used for small children, non-swimmers, or unconscious people.



The U.S. Coast Guard and Indiana law require that you must have USCG approved PFDs on board. The number and type of PFDs depend on the size of the boat and the number of people on board. The PFDs must be in good and serviceable condition and must be readily available.

Watercraft Under 16 Feet in Length: If the boat is less than 16 feet long, or is a canoe or kayak of any length, you must have a wearable (Type I, II, or III) PFD for each person on board all waters.

Watercraft 16 Feet or Longer: If the boat is 16 feet or longer, there must be a wearable PFD (Type I, II, III) for each person on board, PLUS at least one throwable device (Type IV) on board. For example: If there are 3 people on board the 16 foot boat, then 4 PFDs — 3 wearable PFDs and 1 throwable device is needed.

6.0 HAZARD ASSESSMENT

The following section provides information regarding the chemical, physical, and natural hazards anticipated to be present during the site activities to be conducted.

6.1 CHEMICAL HAZARDS

The potential health hazards associated with these NSA Crane sites include inhalation and ingestion of, and direct contact with, various contaminants that may be present. There is no prior sampling data collected from these locations, however based on historic information about the site, the following chemicals of concern are suspected at the respective sites:

- AOC 4 - Navy dyes
- UXO 6 - explosive contaminants, Navy dyes
- AOC 1 - metals
- AOC 2 - explosives, perchlorate, Navy dyes
- AOC 6 - Small Arms Range - metals, PAHs, nitroglycerin

As direct contact will be minimal given the sampling method, it is unlikely that exposure will occur. Area wetting techniques at the land-based sites will be employed if dust generation occurs. Exposure to these compounds is most likely to occur through incidental ingestion of contaminated water, or hand-to-mouth contact during sampling activities. For this reason, PPE and basic hygiene practices (washing face and hands before leaving site) will be the principal methods for minimizing exposures. The signs and symptoms of exposure to the primary constituents that could be encountered on-site are summarized below:

Metals: There are 35 metals that are of concern because of occupational or residential exposure; 23 of these are the heavy metals: antimony, arsenic, bismuth, cadmium, cerium, chromium, cobalt, copper, gallium, gold, iron, lead, manganese, mercury, nickel, platinum, silver, tellurium, thallium, tin, uranium, vanadium, and zinc. Small amounts of these elements are common in our environment and diet and are actually necessary for good health, but large amounts of any of them may cause acute or chronic toxicity (poisoning).

Heavy metal toxicity can result in damaged or reduced mental and central nervous function, lower energy levels, and damage to blood composition, lungs, kidneys, liver, and other vital organs. Allergies are not uncommon and repeated long-term contact with some metals or their compounds may even cause cancer.

The association of symptoms indicative of acute toxicity is not difficult to recognize because the symptoms are usually severe, rapid in onset, and associated with a known exposure or ingestion: cramping, nausea, and vomiting; pain; sweating; headaches; difficulty breathing; impaired cognitive, motor, and language skills; mania; and convulsions.

Arsenic: Arsenic, a naturally occurring element, is found throughout the environment; for most people, food is the major source of exposure. Acute (short-term) high-level inhalation exposure to arsenic dust or fumes has resulted in gastrointestinal effects (nausea, diarrhea, abdominal pain); central and peripheral nervous system disorders have occurred in workers acutely exposed to inorganic arsenic. Chronic (long-term) inhalation exposure to inorganic arsenic in humans is associated with irritation of the skin and mucous membranes. Chronic oral exposure has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyperpigmentation, and liver or kidney damage in humans. Inorganic arsenic exposure in humans, by the inhalation route, has been shown to be strongly associated with lung cancer, while ingestion of inorganic arsenic in humans has been linked to a form of skin cancer and also to bladder, liver, and lung cancer.

Lead: Lead poisoning is most often a chronic disorder and may not cause acute symptoms. With or without acute symptoms, poisoning eventually has irreversible effects. The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

MC and explosive contaminants: Routes of exposure are inhalation, ingestion, skin and eye contact. Signs and symptoms of overexposure may include headaches, dizziness, nausea, hyperactivity, convulsions, seizures, fatigue, and irritability rashes, dry skin and itchy eyes, respiratory problems, joint pain, sore throat, and depression. These effects may be experienced quickly or several hours later. Some can be topically irritating to skin and eyes.

Navy dyes: Acid blue 1, 9, 45, acid yellow 3, 23, 73, acid red 64, acid orange, basic violet 10, and basic yellow 2. Any dyes including acid dyes have the ability to induce sensitization in humans due to their complex molecular structure and the way in which they are metabolized in the body. This is extremely rare

nowadays as we have a much greater understanding through experience and knowledge of dyestuffs themselves. Some acid dyes are used to color food. We wear fabrics every day exposing our skin to dyes.

The greatest risk of disease or injury due to dyes is by ingestion or exposure to dye dust. These scenarios are normally confined to textile workers. Whereby the dye itself is normally non toxic, the molecules are metabolized (usually in the liver) where they may be broken back down to the original intermediates used in manufacture. Thus many intermediate chemicals used in dye manufacture have been identified as toxic and their use restricted. There is a growing trend among governments to ban the importation of dyes synthesized from restricted intermediates. Many intermediates used in dye manufacture such as o-toluidine, benzidine etc. were found to be carcinogenic. All the major chemical companies have now ceased to market these dyes. Some, however, are still produced but they are found to be totally safe when on the fiber in its final state. The use of these dyes is declining rapidly as cheap and safer alternatives are now easily available.

PAHs: PAHs toxicity is very structurally dependent, with isomers (PAHs with the same formula and number of rings) varying from being nontoxic to being extremely toxic. Thus, highly carcinogenic PAHs may be small or large. One PAH compound, benzo[a]pyrene, is notable for being the first chemical carcinogen to be discovered (and is one of many carcinogens found in cigarette smoke). The EPA has classified seven PAH compounds as probable human carcinogens: benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene.

6.1.1 Ingestion and Skin Contact:

Potential exposure concerns to the COCs may also occur through ingesting or coming into direct skin contact with contaminated soils. The likelihood of worker exposure concerns through these two routes are also considered very unlikely, provided that workers follow good personal hygiene and standard good sample collection/sample handling practices, and wear appropriate PPE as specified in this HASP. Examples onsite practices that are to be observed that will protect workers from exposure via ingestion or skin contact include the following:

- No hand-to-mouth activities on site (eating, drinking, smoking, etc.)
- Washing hands upon leaving the work area and prior to performing any hand to mouth activities
- Wearing surgeon's-style gloves whenever handling potentially-contaminated media, including soils, hand tools, and sample containers.

6.2 PHYSICAL HAZARDS

The physical hazards that may be present during the performance of site activities are summarized below:

- MEC (Munitions and Explosives of Concern)
- MPPEH (Materials Potentially Presenting an Explosive Hazard)
- Lifting
- Vehicular and foot traffic
- Ambient temperature extremes
- Slips, trips, and falls
- Water hazards

These physical hazards are discussed in detail in Section 4.0 of the Health and Safety Guidance Manual.

6.2.1 Contact with MEC/MPPEH

Field personnel will practice UXO avoidance techniques. However, because of the mission and history of the sites, MEC/MPPEH may be encountered during operations. To minimize the risk of a UXO encounter, a UXO Technician will provide support during site activities. If MEC/MPPEH are encountered during site activities, all work will stop and personnel will evacuate and secure the site until the area can be addressed by NSA Crane Explosives Safety Personnel and permission is received to resume operations.

6.3 NATURAL HAZARDS

6.3.1 Insect/Animal Bites and Stings, Poisonous Plants, etc.

During warm months (spring through early fall), tick-borne Lyme Disease may pose a potential health hazard. The longer a disease carrying tick remains attached to the body, the greater the potential for contracting the disease. Wearing long sleeved shirts and long pants (tucked into boots). As well as performing frequent body checks will prevent long term attachment. Site first aid kits should be equipped with medical forceps and rubbing alcohol to assist in tick removal. For information regarding tick removal procedures and symptoms of exposure consult the Health and Safety Guidance Manual.

Contact with poisonous plants and bites or stings from poisonous insects are other natural hazards that must be considered. Long pants (tucked into boots), and avoiding potential nesting areas will minimize the hazards of exposure. Site personnel who are allergic to stinging insects such as bees, wasps, and hornets must be particularly careful since severe illness and death may result from allergic reactions. As

with any medical condition or allergy, information regarding the condition must be listed on the Medical Data Sheet and the FOL and SSO notified.

6.3.2 Inclement Weather

Many of the project tasks under this Scope of Work will be performed outdoors. As a result, inclement weather may be encountered. In the event that adverse weather (electrical storms, hurricanes, etc.) conditions arise, the FOL and/or the SSO will be responsible for temporarily suspending or terminating activities until hazardous conditions no longer exist.

6.4 WATER HAZARDS

Planned activities involve locations that are near bodies or on bodies of water. To avoid potential hazards associated with working on or over water (drowning) the field team shall use United States Coast Guard (USCG) approved personal flotation devices and lifeline (tie-off) procedures will be used when working within four feet of the water's edge. Due to the obvious hazards associated with working on or near the water's edge during inclement weather, field activities may be temporarily suspended or terminated at the discretion and direction of the FOL. The Boating Safety Checklist (Attachment V) must be completed prior to beginning work on a boat. See Section 5.3 for Safe Boating Practices.

7.0 AIR MONITORING

Based on the fact that the COCs at this site are not volatile compounds, direct reading instruments will not be used in these areas to evaluate the presence of site contaminants and other potentially hazardous conditions. If conditions or tasks change then this will be re-evaluated.

Workers will use area wetting techniques, if necessary, for dust suppression if visible dust is present during intrusive activities at the land-based sites.

8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS

8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING

This section specifies health and safety training and medical surveillance requirements for both Tetra Tech NUS and subcontractor personnel participating in on site activities.

Tetra Tech NUS and subcontractor personnel who will engage in field associated activities as described in this HASP must have completed:

- 40 hours of introductory hazardous waste site training or equivalent work experience as defined in OSHA Standard 29 CFR 1910.120(e).
- 8-Hour Refresher Training, if the identified persons had introductory training more than 12 months prior to site work.
- 8-hour Supervisory training in accordance with 29 CFR 1910.120(e)(4), if their assigned function will involve the supervision of subordinate personnel.

Documentation of introductory training or equivalent work experience, supervisory, and refresher training as well as site-specific training will be maintained at the site. Copies of certificates or other official documentation will be used to fulfill this requirement.

8.2 SITE-SPECIFIC TRAINING

Tetra Tech NUS will provide site-specific training to Tetra Tech NUS employees and subcontractor personnel who will perform work on this project. Figure 8-1 will be used to document the provision and content of the project-specific and associated training. Site personnel will be required to sign this form prior to commencement of site activities.

TtNUS will conduct a pre-activities training session prior to initiating site work. Additionally, a brief meeting will be held daily to discuss operations planned for that day. At the end of the workday, a short meeting may be held to discuss the operations completed and any problems encountered.

8.3 MEDICAL SURVEILLANCE

Tetra Tech NUS and subcontractor personnel participating in project field activities will have had a physical examination. Physical examinations shall meet the minimum requirements of paragraph (f) of

OSHA 29 CFR 1910.120. The physical examinations will be performed to ensure that personnel are medically qualified to perform hazardous waste site work.

Documentation for medical clearances will be maintained at the job site and made available, as necessary. Subcontractor personnel may use an alternative documentation for this purpose. The "Subcontractor Medical Approval Form" can be used to satisfy this requirement, or a letter from an officer of the company. The letter should state that the persons listed in the letter participate in a medical surveillance program meeting the requirements contained in paragraph (f) OSHA 29 CFR 1910.120, entitled "Hazardous Waste Operations and Emergency Response." The letter should further state the following:

- The persons listed have had physical examinations under this program within the frequency as determined sufficient by their occupational health care provider
- Date of the exam
- The persons identified have been cleared, by a licensed physician, to perform hazardous waste site work.

A sample Subcontractor Medical Approval Form and form letter have been provided to eligible subcontractors in the Bid Specification package.

8.3.1 Medical Data Sheet

Each field team member, including subcontractors and visitors, entering the exclusion zone(s) shall be required to complete and submit a copy of the Medical Data Sheet that is available in Attachment III of this HASP. This shall be provided to the SSO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention.

8.4 SUBCONTRACTOR EXCEPTION

If through the execution of their contract elements the subcontractor will not enter the exclusion zone and there is no potential for exposure to site contaminants, then subcontractor personnel may be exempt from the training and medical surveillance requirements with the exception of Section 8.2. Examples of subcontractors who may qualify as exempt from training and medical surveillance requirements may include surveyors who perform surveying activities in site perimeter areas or areas where there is no potential for exposure to site contaminants and support or restoration services. Use of this Subcontractor Exception is strictly limited to the authority of the CLEAN Health and Safety Manager.

FIGURE 8-1

SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing site inspection activities at NSA Crane, in Crane, Indiana and that I have received site-specific training which included the elements presented below:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Work practices to minimize risks from hazards
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Contents of the Health and Safety Plan
- Emergency response procedures (evacuation and assembly points)
- Spill response procedures
- Review of contents of relevant Material Safety Data Sheets
- Review of the use of the Accident Prevention Plan and Activity Hazard Analysis

I have been given the opportunity to ask questions and my questions have been answered to my satisfaction, and that the dates of my training and medical surveillance indicated below are accurate.

[illegible]

9.0 SPILL CONTAINMENT PROGRAM

9.1 SCOPE AND APPLICATION

It is anticipated that quantities of bulk potentially hazardous materials (greater than 55-gallons) will not be handled during the site activities. It is possible, however, that as the job progresses disposable PPE and other non-reusable items may be generated. As needed, 55-gallon drums will be used to contain unwanted items generated during sampling activities. The drum(s) will be labeled with the site name and address, the type of contents, and the date the container was filled as well as an identified contact person. As warranted, samples will be collected and analyzed to characterize the material and determine appropriate disposal measures. Once characterized the drum(s) will be removed from the staging area and disposed of in accordance with Federal, State and local regulations. Given the likely solid nature of drum contents, a comprehensive Spill Containment Program is not necessary. The following discussion is provided as contingency information only.

9.2 POTENTIAL SPILL AREAS

Should drums contain liquid wastes, potential spill areas will be monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Areas designated for handling, loading, and unloading of potentially contaminated waters and debris present limited potential for leaks or spills.

NOTE: Liquid waste is not anticipated outside of expected decontamination materials.

9.3 LEAK AND SPILL DETECTION

To establish an early detection of potential spills or leaks, periodic inspections by the SSO will be conducted during working hours to visually determine that containers are not leaking. If a leak is detected, the first approach will be to transfer the container contents using a hand pump into a new container. Other provisions for the transfer of container contents will be made and appropriate emergency contacts will be notified, if necessary. In most instances, leaks will be collected and contained using absorbents such as Oil-dry, vermiculite, and/or sand, which may be stored at the staging area in a conspicuously marked drum. This material too, will be containerized for disposal pending analyses. Inspections will be documented in the Project Logbook.

9.4 PERSONNEL TRAINING AND SPILL PREVENTION

Personnel will be instructed on the procedures for spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and/or the SSO will serve as the Spill Response Coordinator for this operation should the need arise.

9.5 SPILL PREVENTION AND CONTAINMENT EQUIPMENT

The following represents the types of equipment that may be maintained at the staging area for the purpose of supporting this Spill Containment Program (depending on the likelihood that drums and/or liquid wastes are generated).

- Sand, clean fill, vermiculite, or other noncombustible absorbent (oil-dry)
- Drums (55-gallon U.S. DOT 1A1 and/or 1A2)
- Shovels, rakes, and brooms
- Labels

9.6 SPILL CONTROL PLAN

This section describes the procedures the TtNUS field crewmembers will employ upon the detection of a spill or leak.

- Notify the SSO or FOL immediately.
- Take immediate actions to stop the leak or spill by plugging or patching the drum or raising the leak to the highest point. Avoid contacting drum contents. Spread the absorbent material in the area of the spill covering completely.

It is not anticipated that a spill will occur in which the field crews cannot handle. Should this occur; however, the FOL or SSO will notify appropriate emergency response agencies.

10.0 SITE CONTROL

This section outlines the means by which TtNUS will delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas of the site. A three-zone approach will be used to control site activities. This three-zone approach will utilize an Exclusion Zone, a Contamination Reduction Zone, and a Support Zone. Use of such controls will restrict the general public, minimize the potential for the spread of contaminants, and protect individuals who are not cleared to enter work areas.

10.1 EXCLUSION ZONE

The exclusion zone will be considered those areas of active operations plus an established safety zone depending on the task. The following represent the exclusion zone boundaries for the following identified tasks:

- Sampling land-based activities – 5 feet surrounding the sample collection points
- Decontamination – 5 feet surrounding the point of operation
- MEC operations – 200 feet surrounding MEC activities

Exclusion zones will be delineated using barrier tape, cones and/or drive poles, and postings to inform and direct facility site personnel and visitors, as necessary.

10.1.1 Exclusion Zone Clearance

A pre-startup site visit will be conducted by members of the field team in an effort to identify proposed subsurface investigation locations, conduct utility clearances, and provide up-front notices concerning scheduled activities within the facility. When base personnel are working within the proximity of this investigation, they will be moved or their operation temporarily discontinued to protect them from potential hazards associated with this operation.

10.2 CONTAMINATION REDUCTION ZONE

The Contamination Reduction Zone (CRZ) will be a buffer area between the Exclusion Zone and any area of the site where contamination is not suspected. The personnel and equipment decontamination will not take place in this area, but will take place at a central location established for this project. This area instead will serve as a focal point in supporting Exclusion Zone activities.

10.3 SUPPORT ZONE

The Support Zone for this project will include a staging area where site vehicles will be parked, equipment will be unloaded, and where food and drink containers will be maintained. The Support Zones will be established at areas of the site where exposure to site contaminants would not be expected during normal working conditions or foreseeable emergencies.

10.4 SITE VISITORS

Site visitors for the purpose of this document are identified as representing the following groups of individuals:

- Personnel invited to observe or participate in operations by TtNUS
- Regulatory personnel (EPA, OSHA, etc.)
- NSA Crane personnel
- Other authorized visitors

Personnel working on this project are required to gain initial access to the site by coordinating with the TtNUS FOL or designee and following established site access procedures.

Upon gaining access to the site, site visitors wishing to observe operations in progress will be escorted by a TtNUS representative (arranged for by the FOL) and shall be required to meet the following minimum requirements:

- Site visitors will be routed to the FOL, who will sign them into the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), the entity which they represent, and the purpose of the visit.
- Site visitors will be required to produce the necessary information supporting clearance to the site. This shall include information attesting to applicable training (40-hours of HAZWOPER training) and medical surveillance as stipulated in Section 8.0 of this document. In addition, to enter the site operational zones during planned activities, visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this HASP.

Note: Visitors will be escorted by UXO personnel while at the site.

Once the site visitors have completed the above items, they will be permitted to enter the operational zone. Visitors are required to observe the protective equipment and site restrictions in effect at the site at the time of their visit. Visitors not meeting the requirements stipulated in this plan will not be permitted to

enter the site operational zones during planned activities. Any incidence of unauthorized site visitation will cause the termination of onsite activities until the unauthorized visitor is removed from the premises. Removal of unauthorized visitors will be accomplished with support from the FOL, SSO or on-site security personnel.

10.5 SITE SECURITY

Site security will be accomplished using existing base security resources and procedures, supplemented by TtNUS personnel, if necessary. TtNUS will retain control over active operational areas. The first line of security will take place at the base boundaries restricting the general public. The second line of security will take place at the work site referring interested parties to the FOL. The FOL will serve as a focal point for site personnel, and will serve as the final line of security and the primary enforcement contact.

10.6 SITE MAPS

A site map will be generated once access routes, utilities, etc., are determined, and it will be adjusted as site conditions change. These maps will show potential points of contact with the public, roadways, and other significant characteristics that may impact site operations and safety. Site maps will be posted to illustrate up-to-date collection of contaminants and adjustment of zones and access points if warranted.

10.7 BUDDY SYSTEM

Personnel engaged in onsite activities will practice the "buddy system" to ensure their safety during this operation.

10.8 MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS

TtNUS personnel will retain MSDSs for chemicals brought on site. The contents of these documents will be reviewed by the SSO with the user(s) of the chemical substances prior to any actual use or application of the substances on site. A chemical inventory of chemicals used on site will be developed using Section 5.0 of the Health and Safety Guidance Manual. The MSDSs will then be maintained in a central location and will be available for anyone to review upon request.

10.9 COMMUNICATION

TtNUS personnel will be working in close proximity to each other at NSA Crane. As a result and since two-way radio communication may or may not be available, hand signals, voice commands, and line of site will provide the initial means of communication. If two-way communication is available, its use will be cleared with Base personnel prior to initiating activities.

External communication will be accomplished by using provided telephones at the site. External communication will primarily be used for the purpose of resource and emergency resource communication.

10.10 ACCIDENT PREVENTION PLAN/ACTIVITY HAZARD ANALYSES

All work conducted in support of this project will be performed using an Accident Prevention Plan (APP), including Activity Hazard Analyses (AHAs) to guide and direct field crews on a task-by-task basis. The APP including the AHAs is included as Attachment IV. Daily safety meetings will be conducted during site work and the task-specific AHA(s) will be reviewed prior to initiating any field activities. This effort will ensure that site-specific considerations and changing conditions are incorporated into the planning effort. Use of the APP will provide the communication line for reviewing task-specific hazards and protective measures associated with each operation. The HASP will be used as the primary reference for selecting levels of protection and control measures.

The FOL and/or the SSO will be responsible for making all parties aware of the contents and requirements of the APP. Any problems encountered with the protective measures required will be documented and brought to the attention of the SSO.

As an ongoing quality assurance effort, the SSO will review operations to insure the AHAs adequately address potential hazards for the tasks being conducted. Where deficient, they will be corrected and that information shared with all field personnel. Amended AHAs will be forwarded to the PHSO for inclusion in future APPs for similar activities.

11.0 CONFINED SPACE ENTRY

It is not anticipated, under the proposed scope of work, that confined space and permit-required confined space activities will be conducted. **Therefore, personnel under the provisions of this HASP are not allowed, under any circumstances, to enter confined spaces.** A confined space is defined as an area which has one or more of the following characteristics:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.
- A Permit-Required Confined Space is one that:
 - Contains or has a potential to contain a hazardous atmosphere.
 - Contains a material that has the potential to engulf an entrant.
 - Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
 - Contains any other recognized, serious, safety or health hazard.

For further information on confined space, consult the Health and Safety Guidance Manual or call the PHSO. If confined space operations are to be performed as part of the scope of work, detailed procedures and training requirements will have to be addressed.

12.0 MATERIALS AND DOCUMENTATION

The TtNUS FOL shall ensure the following materials/documents are taken to the project site and used when required.

- A complete copy of this HASP
- Health and Safety Guidance Manual
- Incident Reports
- Medical Data Sheets
- MSDSs for chemicals brought onsite, including decontamination solutions, fuels, lime, sample preservatives, calibration gases, etc.
- A full-size OSHA Job Safety and Health Poster (posted in the site trailers) (Attachment V)
- Training/Medical Surveillance Documentation Form (Blank)
- Emergency Reference Information (Section 2.0, extra copy for posting)

12.1 MATERIALS TO BE POSTED OR MAINTAINED AT THE SITE

The following documentation is to be posted or maintained at the site for quick reference purposes. In situations in which posting these documents is not feasible (such as no office trailer), these documents should be separated and immediately accessible.

Chemical Inventory Listing (posted) - This list represents the chemicals brought onsite, including decontamination solutions, sample preservations, fuel, etc. This list should be posted in a central area.

Material Safety Data Sheets (MSDSs) (maintained) - The MSDSs should also be in a central area accessible to site personnel. These documents should match the listings on the chemical inventory list for substances used onsite. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

The OSHA Job Safety & Health Protection Poster (posted) - This poster, as directed by 29 CFR 1903.2 (a)(1), should be conspicuously posted in places where notices to employees are normally posted. Each FOL shall ensure that this poster is not defaced, altered, or covered by other material.

Site Clearance (maintained) - This list is found within the training section of the HASP (See Figure -2). This list identifies site personnel, dates of training (including site-specific training), and medical surveillance. The list indicates not only clearance but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities.

Emergency Phone Numbers and Directions to the Hospital(s) (posted) - This list of numbers and directions will be maintained at phone communications points and in each site vehicle.

Medical Data Sheets/Cards (maintained) - Medical Data Sheets will be completed by onsite personnel and filed in a central location. The Medical Data Sheet will accompany any injury or illness requiring medical attention to the medical facility. A copy of this sheet or a wallet card will be given to personnel to carry at times.

Hearing Conservation Standard (29 CFR 1910.95) (posted) - This standard will be posted any time hearing protection or other noise abatement procedures are used.

Personnel Monitoring (maintained) - Results generated through personnel sampling (levels of airborne toxins, noise levels, etc.) will be posted to inform individuals of the results of that effort.

Placards and Labels (maintained) - Where chemical inventories have been separated because of quantities and incompatibilities, these areas will be conspicuously marked using Department of Transportation (DOT) placards and acceptable [Hazard Communication 29 CFR 1910.1200(f)]labels.

The purpose, as stated above, is to allow site personnel quick access to this information. Variations concerning location and methods of presentation are acceptable as long as the objection is accomplished.

13.0 ACRONYM LIST

ACGIH	American Conference of Governmental Industrial Hygienists
APR	Air Purifying Respirators
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CNS	Central Nervous System
CRZ	Contamination Reduction Zone
CSP	Certified Safety Professional
DOD	Department of Defense
DOT	Department of Transportation
DRMO	Defense Reutilization and Marketing Office
EEA	Experimental Explosive Area
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
FFS	Focused Feasibility Study
FID	Flame Ionization Detector
FOL	Field Operations Leader
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	High Efficiency Particulate Air
HSM	Health and Safety Manager
HMX	Cyclotetramethylene tetranitramine octagen
LEL/O ₂	Lower Explosive Limit/Oxygen
MEC	Munitions and Explosives of Concern
MPPEH	Materials Potentially Presenting an Explosive Hazard
MRP	Munitions Response Program
NAVFAC	Naval Facilities Engineering Command
N/A	Not Available
NIOSH	National Institute Occupational Safety and Health
NSA	Naval Support Activity
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PA	Preliminary Assessment
PEL	Permissible Exposure Limit
PG	Professional Geologist
PHSO	Project Health and Safety Officer
PID	Photo Ionization Detector

PM	Project Manager
PPE	Personal Protective Equipment
RDX	Cyclo-1,3,5-trimethylene-2,4,6-trinitramine
SOP	Standard Operating Procedure
SSO	Site Safety Officer
STEL	Short Term Exposure Limit
SVOC	Semi Volatile Organic Compound
TBD	To Be Determined
TPH	Total Petroleum Hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
TWA	Time Weighted Average
USEPA	United States Environmental Protection Agency
UXO	Unexploded Ordnance
WAMS	Water Area Munitions Study
WP	Work Plan

ATTACHMENT I

INCIDENT REPORT FORM

Report Date	Report Prepared By	Incident Report Number										
<u>INSTRUCTIONS:</u> All incidents (including those involving subcontractors under direct supervision of Tetra Tech personnel) must be documented on the IR Form. Complete any additional parts to this form as indicated below for the type of incident selected.												
<table style="width: 100%; border: none;"> <tr> <th style="text-align: left; width: 50%;">TYPE OF INCIDENT (Check all that apply)</th> <th style="text-align: left; width: 50%;">Additional Form(s) Required for this type of incident</th> </tr> <tr> <td>Near Miss (No losses, but could have resulted in injury, illness, or damage)</td> <td><input type="checkbox"/> Complete IR Form Only</td> </tr> <tr> <td>Injury or Illness</td> <td><input type="checkbox"/> Complete Form IR-A; Injury or Illness</td> </tr> <tr> <td>Property or Equipment Damage, Fire, Spill or Release</td> <td><input type="checkbox"/> Complete Form IR-B; Damage, Fire, Spill or Release</td> </tr> <tr> <td>Motor Vehicle</td> <td><input type="checkbox"/> Complete Form IR-C; Motor Vehicle</td> </tr> </table>			TYPE OF INCIDENT (Check all that apply)	Additional Form(s) Required for this type of incident	Near Miss (No losses, but could have resulted in injury, illness, or damage)	<input type="checkbox"/> Complete IR Form Only	Injury or Illness	<input type="checkbox"/> Complete Form IR-A; Injury or Illness	Property or Equipment Damage, Fire, Spill or Release	<input type="checkbox"/> Complete Form IR-B; Damage, Fire, Spill or Release	Motor Vehicle	<input type="checkbox"/> Complete Form IR-C; Motor Vehicle
TYPE OF INCIDENT (Check all that apply)	Additional Form(s) Required for this type of incident											
Near Miss (No losses, but could have resulted in injury, illness, or damage)	<input type="checkbox"/> Complete IR Form Only											
Injury or Illness	<input type="checkbox"/> Complete Form IR-A; Injury or Illness											
Property or Equipment Damage, Fire, Spill or Release	<input type="checkbox"/> Complete Form IR-B; Damage, Fire, Spill or Release											
Motor Vehicle	<input type="checkbox"/> Complete Form IR-C; Motor Vehicle											
INFORMATION ABOUT THE INCIDENT												
Description of Incident <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px;"></div>												
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CORRECTIVE ACTIONS				
Corrective action(s) immediately taken by unit reporting the incident:				
Corrective action(s) still to be taken (by whom and when):				
ROOT CAUSE ANALYSIS LEVEL REQUIRED				
Root Cause Analysis Level Required: Level - 1 <input type="checkbox"/> Level - 2 <input type="checkbox"/> None <input type="checkbox"/>				
Root Cause Analysis Level Definitions				
Level - 1	<p>Definition: A Level 1 RCA is conducted by an individual(s) with experience or training in root cause analysis techniques and will conduct or direct documentation reviews, site investigation, witness and affected employee interviews, and identify corrective actions. Activating a Level 1 RCA and identifying RCA team members will be at the discretion of the Corporate Administration office.</p> <p>The following events may trigger a Level 1 RCA:</p> <ul style="list-style-type: none"> ▪ Work related fatality ▪ Hospitalization of one or more employee where injuries result in total or partial permanent disability ▪ Property damage in excess of \$75,000 ▪ When requested by senior management 			
Level - 2	<p>Definition: A Level 2 RCA is self performed within the operating unit by supervisory personnel with assistance of the operating unit HSR. Level 2 RCA will utilize the 5 Why RCA methodology and document the findings on the tools provided.</p> <p>The following events will require a Level 2 RCA:</p> <ul style="list-style-type: none"> ▪ OSHA recordable lost time incident ▪ Near miss incident that could have triggered a Level 1 RCA ▪ When requested by senior management 			
Complete the Root Cause Analysis Worksheet and Corrective Action form. Identify a corrective action(s) for each root cause identified within each area of inquiry.				
NOTIFICATIONS				
Title	Printed Name	Signature	Telephone Number	Date
Project Manager or Supervisor				
Site Safety Coordinator or Office H&S Representative				
Operating Unit H&S Representative				
Other: _____				

The signatures provided above indicate that appropriate personnel have been notified of the incident.

INSTRUCTIONS:

Complete all sections below for incidents involving injury or illness.
Do NOT leave any blanks.
Attach this form to the IR FORM completed for this incident.

Incident Report Number: (From the IR Form)

EMPLOYEE INFORMATION**Company Affiliation**Tetra Tech Employee? ☐TetraTech subcontractor employee (directly supervised by Tt personnel)? ☐

Full Name

Company (if not Tt employee)

Street Address, City, State and Zip Code

Address Type

Home address (for Tt employees) ☐Business address (for subcontractors) ☐**Telephone Numbers**

Work: _____

Home: _____

Cell: _____

Occupation (regular job title)

Department

Was the individual performing regular job duties?

Yes ☐ No ☐

Time individual began work

_____ AM ☐ PM ☐ OR Cannot be determined ☐**Safety equipment**Provided? Yes ☐ No ☐Type(s) provided: ☐ Hard hat ☐ Protective clothingUsed? Yes ☐ No ☐ If no, explain why☐ Gloves ☐ High visibility vest☐ Eye protection ☐ Fall protection☐ Safety shoes ☐ Machine guarding☐ Respirator ☐ Other (list) _____**NOTIFICATIONS**

Name of Tt employee to whom the injury or illness was first reported

Was H&S notified within one hour of injury or illness?

Yes ☐ No ☐

Date of report

H&S Personnel Notified

Time of report

Time of Report

If subcontractor injury, did subcontractor's firm perform their own incident investigation?

Yes ☐ No ☐ If yes, request a copy of their completed investigation form/report and attach it to this report.

INJURY / ILLNESS DETAILS

What was the individual doing just before the incident occurred? Describe the activity as well as the tools, equipment, or material the individual was using. Be specific. Examples: "Climbing a ladder while carrying roofing materials"; "Spraying chlorine from a hand sprayer"; "Daily computer key-entry"

What Happened? Describe how the injury occurred. Examples: "When ladder slipped on wet floor and worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time"

Describe the object or substance that directly harmed the individual: Examples: "Concrete floor"; "Chlorine"; "Radial Arm Saw". If this question does not apply to the incident, write "Not Applicable".

MEDICAL CARE PROVIDED

Was first aid provided at the site: Yes ☐ No ☐ If yes, describe the type of first aid administered and by whom?

Was treatment provided away from the site: Yes ☐ No ☐ If yes, provide the information below.

Name of physician or health care professional

Facility Name

Street Address, City State and Zip Code

Type of Care?

Was individual treated in emergency room? Yes ☐ No ☐

Was individual hospitalized overnight as an in-patient? Yes ☐ No ☐

Telephone Number

Did the individual die? Yes ☐ No ☐ If yes, date: _____

Will a worker's compensation claim be filed? Yes ☐ No ☐

NOTE: Attach any police reports or related diagrams to this report.

SIGNATURES

I have reviewed this report and agree that all the supplied information is accurate

Affected individual (print)

Affected individual (signature)

Telephone Number

Date

This form contains information relating to employee health and must be used in a manner that protects the confidentiality of the employee to the extent possible while the information is being used for occupational safety and health purposes.

INSTRUCTIONS:

Complete all sections below for incidents involving property/equipment damage, fire, spill or release.
Do NOT leave any blanks.
Attach this form to the IR FORM completed for this incident.

Incident Report Number: (From the IR Form)**TYPE OF INCIDENT (Check all that apply)**

Property Damage ☐ Equipment Damage ☐ Fire or Explosion ☐ Spill or Release ☐

INCIDENT DETAILS**Results of Incident:** Fully describe damages, losses, etc.

Response Actions Taken:

Responding Agency(s) (i.e. police, fire department, etc.)**Agency(s) Contact Name(s)**

--	--

DAMAGED ITEMS (List all damaged items, extent of damage and estimated repair cost)

Item:	Extent of damage:	Estimated repair cost

SPILLS / RELEASES (Provide information for spilled/released materials)

Substance	Estimated quantity and duration	Specify Reportable Quantity (RQ)
		_____ Exceeded? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>

FIRES / EXPLOSIONS (Provide information related to fires/explosions)

Fire fighting equipment used? Yes ☐ No ☐ If yes, type of equipment: _____

NOTIFICATIONS

Required notifications	Name of person notified	By whom	Date / Time
Client: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>			
Agency: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>			
Other: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>			

Who is responsible for reporting incident to outside agency(s)? To ☐ Client ☐ Other ☐ Name: _____

Was an additional written report on this incident generated? Yes ☐ No ☐ If yes, place in project file.

INSTRUCTIONS:

Complete all sections below for incidents involving motor vehicle accidents. Do NOT leave any blanks.
Attach this form to the IR FORM completed for this incident.

Incident Report Number: (From the IR Form)

INCIDENT DETAILS

Name of road, street, highway or location where accident occurred

Name of intersecting road, street or highway if applicable

County

City

State

Did police respond to the accident?

Yes ☐ No ☐

Did ambulance respond to the accident?

Yes ☐ No ☐

Name and location of responding police department

Ambulance company name and location

Officer's name/badge #

Did police complete an incident report? Yes ☐ No ☐ If yes, police report number: _____
Request a copy of completed investigation report and attach to this form.

VEHICLE INFORMATION

How many vehicles were involved in the accident? _____ (Attach additional sheets as applicable for accidents involving more than 2 vehicles.)

Vehicle Number 1 – Tetra Tech Vehicle

Vehicle Number 2 – Other Vehicle

Vehicle Owner /
Contact
Information

Vehicle Owner /
Contact
Information

Color

Color

Make

Make

Model

Model

Year

Year

License Plate #

License Plate #

Identification #

Identification #

Describe damage to vehicle number 1

Describe damage to vehicle number 2

Insurance Company Name and Address

Insurance Company Name and Address

Agent Name

Agent Name

Agent Phone No.

Agent Phone No.

Policy Number

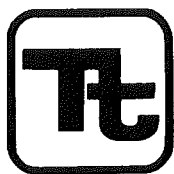
Policy Number

DRIVER INFORMATION							
Vehicle Number 1 – Tetra Tech Vehicle				Vehicle Number 2 – Other Vehicle			
Driver's Name				Driver's Name			
Driver's Address				Driver's Address			
Phone Number				Phone Number			
Date of Birth				Date of Birth			
Driver's License #				Driver's License #			
Licensing State				Licensing State			
Gender		Male <input type="checkbox"/> Female <input type="checkbox"/>		Gender		Male <input type="checkbox"/> Female <input type="checkbox"/>	
Was traffic citation issued to Tetra Tech driver? Yes <input type="checkbox"/> No <input type="checkbox"/>				Was traffic citation issued to driver of other vehicle? Yes <input type="checkbox"/> No <input type="checkbox"/>			
Citation #				Citation #			
Citation Description				Citation Description			
PASSENGERS IN VEHICLES (NON-INJURED)							
<p align="center">List all non-injured passengers (excluding driver) in each vehicle. Driver information is captured in the preceding section. Information related to persons injured in the accident (non-Tt employees) is captured in the section below on this form. Injured Tt employee information is captured on FORM IR-A</p>							
Vehicle Number 1 – Tetra Tech Vehicle				Vehicle Number 2 – Other Vehicle			
How many passengers (excluding driver) in the vehicle? ____				How many passengers (excluding driver) in the vehicle? ____			
Non-Injured Passenger Name and Address				Non-Injured Passenger Name and Address			
Non-Injured Passenger Name and Address				Non-Injured Passenger Name and Address			
Non-Injured Passenger Name and Address				Non-Injured Passenger Name and Address			
INJURIES TO NON-TETRATECH EMPLOYEES							
Name of injured person 1				Address of injured person 1			
Age	Gender	Car No.	Location in Car	Seat Belt Used?	Ejected from car?	Injury or Fatality?	
	Male <input type="checkbox"/> Female <input type="checkbox"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Injured <input type="checkbox"/> Died <input type="checkbox"/>	
Name of injured person 2				Address of injured person 2			
Age	Gender	Car No.	Location in Car	Seat Belt Used?	Ejected from car?	Injury or Fatality?	
	Male <input type="checkbox"/> Female <input type="checkbox"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Injured <input type="checkbox"/> Died <input type="checkbox"/>	
OTHER PROPERTY DAMAGE							
Describe damage to property other than motor vehicles							
Property Owner's Name				Property Owner's Address			

COMPLETE AND SUBMIT DIAGRAM DEPICTING WHAT HAPPENED

ATTACHMENT II

UNEXPLODED ORDNANCE AND CHEMICAL WARFARE AGENTS ACTIVITIES OPERATING PROCEDURES FOR AT NSA CRANE



TETRA TECH NUS, INC.

STANDARD OPERATING PROCEDURES

Number	HS-2.0	Page	1 of 15
Effective Date	03/08	Revision	2
Applicability	Tetra Tech NUS, Inc.		
Prepared	Ralph Brooks, UXO Manager		
Subject	MUNITIONS AND EXPLOSIVES OF CONCERN AND CHEMICAL WARFARE AGENTS ACTIVITIES		
Approved			

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1.0 GENERAL

This Standard Operating Procedure (SOP) was prepared in accordance with applicable U.S. Army Corps of Engineers procedures and policies governing field activities where Munitions and Explosives of Concern [MEC], Material Potentially Presenting an Explosive Hazard [MPPEH] and/or Chemical Warfare Material (CWM) could be encountered. All personnel conducting operations under this SOP must read and understand applicable parts of references listed in section 9.1 below prior to commencing any work described within this SOP. Other documents supporting this SOP include project-specific Work Plans and Health and Safety Plans which are prepared for the purpose of accomplishing work that contain a Munitions and Explosives of Concern [MEC] or CWM component [MEC includes Unexploded Ordnance (UXO), Discarded Military Munitions (DMM) and Munitions Constituents (MC)].

2.0 PURPOSE

This SOP applies to all operations involving MEC and/or CWM support during field operations at various sites where Tetra Tech NUS (TtNUS) personnel are present. It provides procedural requirements for any activity involving MEC and CWM, as well as detailed procedures for the location, identification, documentation, and emergency response actions pertaining to MEC/CWM activities.

3.0 APPLICABILITY

This SOP applies to persons who may visit any site where TtNUS is performing work that involve some MEC or CWM component. Compliance with the content of this SOP is mandatory for all TtNUS personnel, subcontractors, and visitors to any site where MEC/CWM activities are in progress.

4.0 RESPONSIBILITIES

Project Manager

Effective implementation of this SOP at the project level will be the ultimate responsibility of the assigned TtNUS Project Manager. The Project Manager is responsible for ensuring that all applicable rules and regulations are complied with, and that all necessary safety precautions are taken to conduct operations in accordance with this SOP. To fulfill this responsibility, the assigned Project Manager is required to ensure that appropriately-qualified technical staff are involved in all stages of project planning and field work, as well as for ensuring that appropriate resources are marshaled and used on his/her assigned projects. For projects involving MEC and/or CWM, this will involve ensuring that a suitably qualified and experienced UXO Technician and a site Health and Safety Officer are part of the project team. In some cases, the assigned UXO Technician may also serve as the project site Health and Safety Officer.

It is also the responsibility of the Project Manager to ensure that all personnel conducting field activities in accordance with this SOP have proper training (including hazard control briefings) and, if required, the proper certifications for the job being performed.

UXO Technician

A suitably qualified and experienced UXO Technician will be included as part of the project team where these types of concern are known or suspected to exist. The UXO Technician will be primarily responsible for advising the Project Manager on all MEC/CWM matters, including the measures that will be necessary to effectively implement and adhere to this SOP. Other specific duties will include:

- Providing technical expertise and input into project planning activities and documents such as the project-specific Work Plan and Health and Safety Plan
- Assessing worksite areas for MEC/CWM concerns prior to the initiation of any other onsite activities

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- Participating in the development and conductance of site specific training sessions and daily tailgate meetings to communicate MEC/CWM matters to the field personnel
- Maintaining a sound familiarity with the contents of this SOP, the contents of the references listed in section 9.1, and keeping current with new information and technology pertinent to MEC/CWM matters

Site Health and Safety Officer

A suitably qualified and experienced health and safety professional will be assigned to all projects that involve fieldwork. Project-specific responsibilities will include:

- Effectively implementing the requirements and restrictions specified in the project-specific Health and Safety Plan
- Ensuring that all personnel participating in onsite activities have satisfied all appropriate medical and training qualifications prior to participating in any onsite activities.
- Conduct initial site-specific health and safety training for all personnel participating in onsite activities.
- Conduct tail-gate safety briefings prior to the initiation of all tasks, but not less than daily.
- On certain projects, these duties may be assigned to the UXO Technician. This would be considered acceptable on field projects where the predominant concern is contact with MEC and/or CWM, and minimal health concerns or requirements (e.g., chemical exposures or monitoring) exist.

Corporate Health and Safety Manager

Perform periodic project audits and evaluations to determine the ongoing effectiveness of this SOP to address MEC/CWM concerns, and review and evaluate this SOP to determine any revisions that are appropriate.

5.0 LOCATION OF OPERATIONS

MEC and/or CWM concerns may exist at TtNUS project sites throughout the continental United States and abroad. Wherever the installation/site is located, it will be necessary to ensure that project planning activities include collecting available historical information that may be pertinent to these issues, as well as identifying and addressing contract/client-specific requirements and any location-specific requirements (e.g., State, local-level, or host-nation requirements). A detailed site description, discussion of known and/or suspected contamination sources, and results of previous studies will be provided to field personnel as part of their field mobilization and initial site-specific training activities.

The initial project evaluation must involve the performance of a preliminary risk assessment, including the investigation of probable contaminants, potential transport pathways, the identification of potential receptors, and a preliminary evaluation of human health and environmental concerns. Preliminary identification of applicable or relevant and appropriate requirements (ARARs) will also be made available to field personnel conducting activities at the installation.

6.0 PERSONNEL QUALIFICATIONS AND REQUIREMENTS

6.1 **Personnel Qualifications:** Qualifications of those personnel actively involved in MEC/CWM operations shall be as follows:

- UXO personnel shall be graduates of a military EOD School of the United States. Graduate of a military EOD school of Canada, Great Britain, Germany, or Australia. Graduate of a formal training course of instruction or EOD assistant course as stated in DDESB TP-18.
- The Senior UXO Supervisor (SUXOS) will have at least 10 years in military EOD/UXO Experience, of which more than 5 years will be in a supervisory position.

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- c. UXO personnel are responsible for maintaining current status with training and medical surveillance requirements, as specified in the project-specific Health and Safety Plans and OSHA 29 CFR 1010.120, paragraphs (e) and (f).

6.2 Personnel Requirements: During any activity where the possibility that MEC and/or CWM may be encountered (no matter how remote), the following requirements will be met:

- a. One UXO-qualified technician will be required to support each field team engaged in operations in areas that might contain MEC/CWM.
- b. One UXO-qualified technician will be present at the site during all activities to provide MEC/CWM support in the event their services are required.

7.0 PERSONNEL LIMITS

The activities to be conducted under most contracts will not normally be conducted in areas requiring maximum personnel limitations except for intrusive MEC activities. Work will not be permitted unless at least two persons are present in the work area. The provisions of 29 CFR 1910.120 concerning personnel qualifications and requirements will be followed while working on-site. Any additional personnel limitation requirements specified by the client or the project work location (e.g., state, local ordinance, host nation, etc.) will also be identified and adhered to at all times.

7.1 Personnel Limits for MEC Operations:

- a. MEC Avoidance Operations – One UXO Technician (UXO Technician III or UXO Technician II)
- b. MEC Intrusive Operations - Two UXO Technicians (one UXO Technician III and one UXO Technician II or I)

8.0 MATERIAL LIMITS

The properties and configurations of specific explosive materials are not addressed in this SOP. That level of detail is required to be addressed in project-specific Work Plans and Health and Safety Plans. This SOP must be maintained onsite along with these project-specific documents to aid in appropriate communication and implementation activities. Bulk liquids to be used for decontamination of equipment will be maintained in 2-gallon containers or less. Material Safety Data Sheets (MSDSs) will be kept on file in the TtNUS Command Post for any chemical substances brought to the project site by TtNUS and TtNUS subcontractor personnel. This is addressed in greater detail in section 5. of the TtNUS Health and Safety Guidance Manual.

9.0 SAFETY REQUIREMENTS

9.1 Referenced Safety Requirements: The safety requirements that apply to the MEC/CWM operations covered under this SOP are:

- a. OSHA 29 CFR 1910.120 and 1926.65 – Hazardous Waste Operations and Emergency Response (HAZWOPER). Available online at:
http://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=0&p_keyvalue=OSHA_Std_toc.html

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- b. US Army Corps of Engineers Engineering Regulation 385-1-92, *Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OE) Activities*. Available online at:
<http://www.usace.army.mil/inet/usace-docs/eng-regs/er385-1-92/entire.pdf>
- c. US Army Corps of Engineers Engineering Pamphlet (EP) 385-1-95a, *Basic Safety Concepts and Consideration for OE Operations*. Available online at:
<http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep385-1-95a/entire.pdf>
- d. US Army Corps of Engineers Engineering Manual (EM) 385-1-1, *Safety and Health Requirements*. Available on line at:
<http://www.usace.army.mil/publications/eng-manuals/em385-1-1/toc.htm>.
- e. US Army Corps of Engineers Data Item Description OE – 025.02, *Personnel/Work Standards*. Available on line at:
http://www.hnd.usace.army.mil/oew/policy/dids/FY04DIDs/OExxx/oe025_02.pdf
- f. US Army Corps of Engineers Engineering Pamphlet (EP) 1110-1-18, *Ordnance and Explosive (OE) Response*. Available on line at:
<http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep1110-1-18/entire.pdf>
- g. US Army Corps of Engineers Engineering Pamphlet (EP) 75-1-2, *Unexploded Ordnance Support for Hazardous, Toxic and Radioactive Waste and Construction Activities*. Available on line at: <http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep75-1-2/entire.pdf>
- h. US Army Corps of Engineers Engineering Pamphlet (EP) 75-1-3, *Recovered Chemical Warfare Material (RCWM) Response Process*. Available on line at:
<http://www.usace.army.mil/usace-docs/eng-pamphlets/ep75-1-3/entire.pdf>
- i. US Army Technical Manual 9-1300-206 (TM 9-1300-206), *Ammunition and Explosive Hazards*.
- j. Technical Manual 60A-1-1-31, *Explosive Ordnance Disposal Procedures, General Information on EOD Disposal Procedures*.

9.2 Specific Safety Requirements:

- a. All site operations will be suspended if any site worker encounters an item of suspected MEC/CWM. Site work will remain suspended until the item is inspected and cleared by the UXO Technician.
- b. All site operations will be suspended if so ordered by an authorized client representative (i.e., Installation Range Control and/or Safety Office).
- c. Buddy System –
 - i. Escort/Avoidance - A minimum of two personnel, at least one a UXO-qualified technician will be present all sites where MEC is suspected or present.
 - ii. Intrusive – A minimum of two UXO – qualified personnel [One Technician III and one Technician II or I] will conduct intrusive removal operations, with third person observing from a safe area to contact emergency support, if required.
- d. Standard work practices as outlined in project-specific Health and Safety Plans and/or Work Plans will be observed.

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9.3 Inherent MEC/CWM Hazards: MEC/CWM operations have inherent safety and health risks associated with the various field activities conducted. All planned activities will be conducted in accordance with the requirements of the references listed in Section 9.1 above, as safety is the primary consideration in all MEC/CWM activities. Every effort should be made to determine all hazards associated with the site through a thorough research of archives, past site/range uses, and any other available information. Some of the hazards to consider are:

- a. Propellant, Explosives, and Pyrotechnics (PEP)
- b. Depleted Uranium (DU)
- c. White Phosphorus (WP)
- d. Corrosive chemicals (acids and bases) and decontamination agents
- e. Toxic gases, liquids and solids
- f. Corroded and damaged containers, munitions bodies, drums, etc.
- g. Fuze conditions
- h. Etiological agents

10.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Task-specific PPE will be identified in project-specific Health and Safety Plans. Typical PPE for project sites where the principle concern is for MEC/CWM will include the items listed below. Items marked with an asterisk (*) will be available and will be used as specified in the Health and Safety Plan and/or as determined by the TtNUS Site Health and Safety Officer.

- a. Safety glasses
- b. Safety shoes (and protective over boots or steel-toed rubber boots). NOTE: During geophysical survey operations, the UXO technicians will not wear steel-toed boots as they interfere with the magnetometer survey; however, around heavy equipment and activities where foot and overhead hazards may exist, steel-toed boots and hard hats will be worn.
- c. Cotton clothing (with protective coveralls*)
- d. Gloves (type to be specified for each project task in the Health and Safety Plan and/or by the site Health and Safety Officer)
- e. Respiratory protection equipment* (29CFR1910.134)
- f. Hearing protection*
- g. Hard hats*

11.0 EMERGENCY RESPONSE AND CONTINGENCY PLANS

- 11. Emergency Contacts: The identification of (and means to communicate with) appropriate local emergency response agencies must be identified as part of project planning/mobilization activities, and these agencies must be contacted prior to the initiation of any onsite work. These initial communications must determine the capabilities of these agencies to respond to foreseeable emergency situations, their willingness to respond, and their locations/driving directions/phone numbers. These details must be specified in the project-specific Health and Safety Plan and posted in the site Command Center/Field office.

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At a minimum, the names and means of communication (phone number, radio frequency, etc.) of the following parties must be included in the project-specific Emergency Contacts procedure:

- a. Local Emergency Fire Response that will respond (i.e., local Fire Department)
- b. Emergency Medical Assistance (Hospital, Emergency Room, and ambulance service that will respond)
- c. Installation Safety Office or other client safety/emergency response contact
- d. Installation EOD Office/Detachment
- e. Installation Environmental Office

The senior TtNUS managing employee onsite (Project Manager, Site Manager, Site Supervisor, Field Operations Leader) is responsible for initiating these calls in the event of an emergency where such support is needed. If the Project Manager is not onsite at the time of an emergency event, he/she must be added to the above list of contacts.

In the event of an emergency, all site personnel will be evacuated to a predetermined location away from the work place. Emergency Response Planning will be addressed in the project-specific Health and Safety Plan and will be in accordance with either 29 CFR 1910.38(a) or 1910.120(l). TtNUS will utilize the Installations Base Fire Protection and Emergency Services in emergencies or potential emergencies.

11.2 Contingency Plans: The following contingency plans will be implemented:

- a. Pre-Planning – Upon arrival at the site/installation, the TtNUS Field Operations Leader (FOL) and/or the Site Safety Officer will meet with the Base or local Fire Protection Department, Base Security Personnel or local Police Department, and onsite and/or offsite Emergency services to notify them of the activities that are to be undertaken, when, and where. All site personnel will be required to follow established base/local emergency procedures and will rely on base/local services to handle emergency calls when needed.
- b. Emergency Escape Procedures and Assignments – Upon notification of a site emergency that requires evacuation, all site personnel will proceed to predetermined locations based on emergency location and wind direction. An alternate assembly point will be designated in case personnel cannot reach these locations without danger to their lives and health. These primary and alternate escape routes and meeting places will be designated during the daily hazard control briefing. Personnel will be trained to remain at the assembly points until directed to either resume work or to leave the site.
- c. Procedures to Account for Site Personnel – The site work force is typically small enough that accounting for personnel will not be a problem via visual head counting. On projects with larger field team sizes, roll calls will be taken using the daily sign in logs, logbook entries, or the tail-gate briefing sheets. Accounting for personnel will be the Field Operations Leader's responsibility.
- d. Rescue and Medical Duties – TtNUS personnel will not be authorized to participate in emergency rescue operations. Typical first aid response equipment that is to be on hand at a project site includes suitable first aid kit, an emergency eye wash station, and at least one Five lbs Class ABC fire extinguisher.

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- e. Activation of Emergency Response Procedures - Should an emergency occur which requires the support of outside services, the appropriate contacts will be made by the senior TtNUS managing employee onsite (Project Manager, Site Manager, Site Supervisor, Field Operations Leader). A list of appropriate contacts will be posted at the Command Post. Cellular phones, land-line phones, or hand-held radios will be the primary means of communication.

f. Airborne Chemical Release Contingency Plan –

- (1) Chemical Release Monitoring – every member of the site team will be responsible for observing and reporting any gross chemical releases or conditions that could lead to releases. Air monitoring will be performed as described in the project-specific Work Plans and Health and Safety Plans.
- (2) Responses to Measured Airborne Chemical Releases – the readings on monitoring instrumentation will be compared to the action levels specified in the project-specific Work Plans and Health and Safety Plans. The primary purpose of appropriate real-time monitoring instruments will be monitor worker breathing zone areas for the protection of employee health. The project-specific Health and Safety Plan will specify actions that are to be taken in the event that monitoring instrument readings indicate that detected concentrations may represent a health threat to onsite workers. Area and perimeter monitoring as well as sample screening activities may also be called for in the Work Plan or Health and Safety Plan, but these are secondary purposes for the use of these instruments.

Unless otherwise specified in a project-specific Health and Safety Plan, the following monitoring instrument action levels and response measures will be observed on MEC/CWA sites:

<u>Parameter</u>	<u>Action Level</u>
Total Organic Vapors	Any sustained level above background
Airborne particulates	Readings >2.5 mg/m ³
Flammable Vapors	10% of the Lower Explosive Limit (LEL)

If such levels are noted at site perimeters or adjacent to neighboring residential or commercial property, the TtNUS Field Operations Leader and/or the Site Safety Officer will notify the appropriate client or base contacts.

- g. Liquid Release Monitoring – All field team members will be responsible for observing and reporting any liquid chemical releases or conditions that could lead to a release. If field operations on site result in a release of liquid chemicals in the absence of vapors, field personnel will attempt to contain the liquid by means of berms constructed with available equipment. If the work team cannot control the spill, they will leave the area for the assembly point quickly, without panic. The TtNUS Field Operations Leader and/or the Site Safety Officer will notify the appropriate client/base contact. This is not considered to be a significant probability during operations. However, in the unlikely instance that it should occur, field personnel may affect these types of defensive efforts, providing that such a response does not appear to present a chemical overexposure or other personal health or safety threat.

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12.0 TYPICAL CLIENT/FACILITY SAFETY POINTS OF CONTACT

The following positions are typically encountered on MEC/CWA projects. Communication and coordination with these positions should be implemented and maintained throughout all project activities (from pre-field operations planning through to project close-out).

- a. Installation Safety Management Office
- b. Installation Ordnance Officer and/or EOD Officer
- c. Installation Radiation Officer
- d. Installation Environmental Office

13.0 TOOLS AND EQUIPMENT

Tools and equipment necessary to safely and effectively accomplish the objectives of a project will be detailed in the project-specific Work Plans and Health and Safety Plans. Items commonly required for MEC/CWM operations are presented below:

13.1 Personal Protective Equipment

- a. Respiratory Protective Equipment (i.e., air purifying or air supplied devices)
- b. Dermal (chemical resistant) protective equipment (e.g., coveralls, gloves, eye and face protection)
- c. Physical safety PPE (hard hats, hearing protection, safety glasses, safety shoes, etc.)

13.2 Air Monitoring Equipment

- a. Explosive/O₂ Meter (Combustible Gas Indicator)
- b. Direct reading Organic Vapor Analyzer (PID or FID)
- c. Direct reading particulate meter
- d. Radiation Survey Meters and TLD Badges

13.3 Geophysical/Hydrology Survey Instrumentation

- a. Magnetometers (Cesium Vapor, Schonstedt)
- b. Electromagnetic Terrain Conductivity Meter (EM-31)
- c. Time-Domain Electromagnetic All-Metals Detector (EM-61)
- d. Water Level Indicator/Recorder
- e. pH/Temperature/Conductivity Meter for water samples (Horiba, etc.)
- f. Survey Equipment (transit, tripod, level, etc.) as required

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13.4 Support Equipment

- a. Schonstedt Magnetic Locators (GA-52Cx or equivalent passive instrument) will be used for anomaly detection MEC activities. The GA-52Cx detects the magnetic field of any ferromagnetic object.
- b. Schonstedt MG-220 Magnetic Gradiometer (Down-Hole Magnetometer or equivalent) will be used to conduct down hole anomaly checks. The MG-220 detects the magnetic field of any ferromagnetic object as it is lowered into a borehole.
- c. Marking tape, pin flags, stakes, utility spray paints, etc.

13.5 CWM Support Equipment

- a. Suitable monitoring equipment capable of detecting agents of concern

13.6 Decontamination Equipment

As required by the level of protection for each site. See Site Health and Safety Plan for specifics.

13.7 Hand Tools/ Miscellaneous Equipment

As may be required.

14.0 ENVIRONMENTAL CONCERNS

The field operations covered by this SOP will be performed in such a manner as to minimize the effects of pollution of air, water, or land and to control noise and dust emissions within reasonable limits.

Every effort will be made to:

- a. Protect the land areas and to preserve them in their existing condition.
- b. Protect water resources, including measures for run-off or run-off controls if applicable.
- c. Implement sediment control measures, where warranted. These measures will also be implemented to control erosion.

Usually, field operations will generate solid and liquid waste (Investigative Derived Waste – IDW) requiring onsite handling and possible offsite disposal. The major types of waste to be generated, their environmental concerns, and their handling and disposition are summarized below:

- a. Personal and equipment decontamination containers disposed offsite following a thorough decontamination. Liquid waste will be included with well purging and development fluids.
- b. Personal Protective Equipment (PPE) will be double-bagged and will be the responsibility of TtNUS to dispose of according to applicable regulations. Disposal will normally be offsite.

It is not anticipated that any chemical releases will occur during the field activities.

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The MSDSs for chemicals being brought onto the installation for use in field operations will be listed on a site-specific Chemical Inventory and maintained at the TtNUS Field Command Post. Copies of these documents are to be made available to client and offsite representatives who may be called upon to respond to an emergency event.

15.0 MEC/CWM PROCEDURES FOR FIELD OPERATIONS

15.1 General – field procedures for work on any installation can include any or all of the following tasks:

- a. Initial entry into suspect areas
- b. CWM operations
- c. Surface and subsurface sampling
- d. Monitoring well installation
- e. Exploratory trenching
- f. Geophysical surveys
- g. Other miscellaneous operations

15.2 Initial Entry – initial entry into suspect areas requires a UXO-qualified technician with a magnetometer (GA-52Cx or equivalent) to screen a path into the area. The screened area is marked with lanes using either pin flags with plastic pins or marking tape. Suspect items on the surface and subsurface magnetic anomalies will be marked, usually with a different color tape or flag, and will be avoided by team members. The site where the work is to be conducted will be thoroughly screened for MEC/CWM contamination prior to any work commencing. All personnel will stay within the cleared areas and not venture out into areas not screened. If an area that has magnetic anomalies cannot be avoided, the UXO-qualified technician will hand excavate down to the anomaly to check to see if a hazard exists. Before excavation begins, the immediate area will be cleared of non-essential personnel outside of what could be a fragmentation zone (as determined by the UXO Technician). If the excavation reveals a hazard, the emergency notification procedures in paragraph 11.0 will apply.

15.3 CWM Operations - prior to conducting CWM operations, an Emergency Response Plan as required by 29CFR1910.120 and DA Pam 50-6 will be developed and implemented. Most of the information required to develop this plan should be obtained from the installation safety office; however, as a minimum, the following elements will be addressed:

- a. Pre-emergency planning and procedures for reporting incidents to appropriate government agencies for potential chemical exposure, person injuries, fire/explosions, environmental spills and releases, and discovery of radioactive materials.
- b. Personnel roles, lines of authority, communications.
- c. Posted instructions and list of emergency contacts: physicians, nearby notified medical facility, fire and police departments, ambulance service, state/local/federal environmental agencies, Certified Industrial Hygienist (CIH), and installation commander.
- d. Emergency recognition and prevention.
- e. Site topography, layout and prevailing weather conditions.

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- f. Criteria and procedures for site evacuation (emergency alerting procedures/employee alarm system, emergency PPE and equipment, safe distance, place of refuge (assembly area), evacuation routes, site security and control).
- g. Specific procedures for decontamination and medical treatment of injured personnel.
- h. Route maps to nearest pre-notified medical facility.
- i. Criteria for initiating community alert program, contacts and responsibilities.
- j. Critique of emergency responses and follow-up.
- k. Material Safety Data Sheets (MSDS) for each hazardous substance anticipated to be encountered on site would be made accessible to site personnel at all times.

- 15.4 Sampling – sampling will be conducted in accordance with established protocols and methodologies. Site-specific sampling requirements will be presented in the project-specific Work Plans and/or in other project-specific documents such as Field Sampling and Analysis Plans and Quality Assurance Plans.

Prior to initiating any sampling activities, an UXO-qualified technician will screen sites potentially contaminated with MEC/CWM. A magnetometer will be used to screen entry into a suspect area as in paragraph 15.2 above. Lanes will be marked and suspect items and subsurface anomalies will be identified and avoided. The immediate sampling area will be surface-screened prior to the introduction of the sampling team into the area.

Prior to any subsurface intrusive sampling, another check with a magnetometer needs to be accomplished. A magnetometer can be used for collecting subsurface samples not greater than 1 foot. If excavation of a borehole or hand auguring hole is to exceed this depth, a MG-230 Magnetic Gradiometer (down hole magnetometer) shall be utilized with readings taken at one foot intervals.

If an anomaly is detected, the location will be marked and avoided. If appropriate and acceptable, an alternate sampling location (in a cleared area) will be designated. If the sampling location cannot be relocated then the UXO-qualified technician will hand excavate down to the anomaly to determine if it is hazardous. If it is not hazardous, the object will be set aside and the sampling event will continue. If the object has been determined to be hazardous or suspect, the sampling team will move out of the area and the emergency procedures listed in paragraph 11.0 will be implemented.

- 15.5 Monitoring Well Installation – the area within a radius twice the size of the largest equipment used around the borehole and access path will be screened with a magnetometer and be cleared of anomalies. Once this is accomplished, the areas around borehole sites will be marked using colored marking tape and/or pin flags. Heavy equipment such as front-end loaders, backhoes, and bulldozers will not be used to develop or establish drill sites. The following action will be followed:

- a. A magnetometer will be used directly over the borehole site to check for buried items down to 1 foot. After a surface check, the UXO-qualified technician will hand auger down to a depth of one foot and check down the hole using the MG-220 magnetometer, in one foot increments.
- b. Once the hand-auguring hole has been cleared, the drill rig will be positioned over the proposed borehole. Drilling will commence to a depth of one foot, the drill auger will be removed from the borehole, the drill crew chief and UXO personnel will make observations of the soil from the core barrel and the soil removed from the hole by hand auger (if needed). The drilling log and lithologic log will be maintained in accordance with standard practices, noting any metal objects that may be found.

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- c. The drilling derrick will be secured and drill rig moved to a position at least 20 feet from the borehole.
- d. The borehole will be checked again with the MG-220 magnetometer.
- e. If an anomaly is present, the borehole will be abandoned and another location selected. The new borehole should be at least six feet from the original borehole. If an anomaly is not detected and the clearance is given, the drill rig shall be positioned back over the borehole, and drilling will proceed to the next interval.
- f. Repeat above steps at intervals of 1 foot, until a depth of 30 feet in impact areas or as determined in others is reached. At the maximum depth plus one foot, a magnetometer reading shall be taken with the MG-220 set on the maximum sensitivity. The instrument will detect larger objects (approaching 100 lbs.) that could be expected to penetrate to depths of 10 feet or more.

- 15.6 Exploratory Trenching and Excavation – at times, exploratory trenching may be required to determine the lateral extent of a landfill, burial pit, or subsurface geophysical anomaly. Trenching and excavation to uncover a subsurface area will be conducted using a backhoe, an excavator, or sometimes a front-end loader. **Any trenching or excavation activities (regardless of depth) must be done in accordance with OSHA 29 Subpart P requirements, which must be considered and addressed in the project-specific Health and Safety Plan.**

On project sites where excavation activities are within the scope of work and a MEC/CWM concern exists, the following additional procedures will be utilized to conduct these operations:

- a. The surface of the area to be trenched or excavated will first be swept with a magnetometer. Anomalies will be hand excavated to determine if hazardous.
- b. No more than 0.5 feet of surface soil will then be gingerly removed (scraped) from the area of concern.
- c. The heavy equipment will be removed at least 20 feet away from the area, and the area will be checked with a magnetometer. If the area is a trench, the entire length of the trench will be checked with a magnetometer and the excavation can continue six inches at a time.
- d. Anomalies will continue to be uncovered by hand excavation until the desired results are obtained and the trench/area is abandoned and refilled.
- e. If excavation depths reach 4 feet, suitable means of access/egress must be provided (e.g., ladders) and atmospheric monitoring must be performed prior to any entries. To avoid entry into the excavation the MG220 may be used. Area will be checked in 1 foot intervals. Once again after the proper depth of soil is excavated, the heavy equipment is removed from the area (>20 feet) and the area is rechecked with the magnetometer.
- f. The above procedures are followed until the desired depth is reached and/or the desired results are obtained.

- 15.7 Geophysical Surveys – there are several instruments that can be used to conduct geophysical surveys. The GA-52Cx (Schonstedt) and the MG-220 are magnetometers and are passive instruments. The Geonics Terrain Conductivity Meter (EM-31) is an active instrument and is commonly used to measure subsurface terrain conductivity. This information can be used geophysical surveys, as well as for locating voids, discontinuities in soil structures such as boundaries of disposal pits and buried conducting objects. An Ordnance Safety Analysis of the

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Geonics Model EM-61 Non-Contacting Terrain Conductivity Meter was conducted by the Naval Surface Warfare Center at the request of TtNUS in April 1993. The analysis concluded, in summary, that the "Geonics EM-61 poses no ordnance safety hazard when operated in the normal survey mode, where the device is held at hip height." However, the Geonics EM-61 should not be used with the boom on the ground if ordnance is present or suspected.

When using the magnetometer or the EM-61, a UXO-qualified technician will conduct a surface sweep of the area to be surveyed to ensure that no surface ordnance or other hazards exist. The magnetometer is a passive instrument; therefore, no special ordnance safety precautions are required.

Manufacture recommended procedures for the EM-61 must be followed to ensure safe operation during the geophysical survey. Standard survey protocols and quality assurance methods will also be required during survey operations.

- 15.8 Miscellaneous Operations – A UXO Technician will be present for any and all field activities that are in areas suspected to contain MEC and/or CWM. These areas also include those areas covered with water and creeks, canals, etc.

Operations that involve the inspection, hazard classification, segregation, and final disposal of UXO, DMM, MC and related scrap will not be covered in this SOP. Demilitarization is not authorized unless specific work plans, SOPs, health and safety plans and other established procedures are written and approved addressing these operations.

16.0 HAZARD CONTROL BRIEF

A Health and Safety Hazard Control Briefing (i.e., tailgate meetings) will be conducted daily prior to the start of onsite activities. The briefing will be detailed and will cover the information in the Safe Work Permits for the anticipated tasks for the day, as well as applicable portions of this SOP. Additional briefings will be conducted as necessary for tasks that become necessary during the course of a workday, if they were not covered in the morning briefing. These briefings are in addition to (not in place of) the site-specific health and safety training that is required for all onsite personnel prior to their participation in any onsite activities.

The following information will be given during the daily briefings:

- a. Overview of task(s) to be performed and review of appropriate Safe Work Permits with task participants.
- b. Overview of the day's objectives, as well as general site hazards
 - Unexploded Ordnance Hazards
 - Chemical Warfare Agents and Materials
 - Physical Hazards
- c. Overview of Standard Work Practices pertinent to the day's planned activities
- d. Review of any worker incidents or near-miss events, including a review of corrective/preventive measures to prevent recurrence
- e. Overview of Emergency Response Actions, evacuation routes and assembly points

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17.0 SECURITY

Field activities under various TtNUS contracts are typically unclassified and normal security measures apply in accordance with above references (section 9.1 above). TtNUS personnel and their subcontractors will check in with the appropriate client/installation's security office and may be issued security badges for entry into certain work areas. This SOP will not cover special security requirements for projects involving MEC/CWM as most installations have established policies and procedures on reporting and securing recovered items that are MEC and/or CWM. The TtNUS Project Manager will incorporate all security procedures required by the installation into the site work plan.

ATTACHMENT III

MEDICAL DATA SHEET

MEDICAL DATA SHEET

This Medical Data Sheet must be completed by on-site personnel and kept in the command post during the conduct of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project _____

Name _____ Home Telephone _____

Address _____

Age _____ Height _____ Weight _____

Person to notify in the event of an emergency: Name: _____

Phone: _____

Drug or other Allergies: _____

Particular Sensitivities : _____

Do You Wear Contacts? _____

What medications are you presently using? _____

Name, Address, and Phone Number of personal physician: _____

Note: Health Insurance Portability and Accountability Act (HIPAA) Requirements

HIPAA took effect April 14, 2003. Loosely interpreted, HIPAA regulates the disclosure of Protected Health Information (PHI) by the entity collecting that information. PHI is any information about health status (such as that you may report on this Medical Data Sheet), provision of health care, or other information. HIPAA also requires TtNUS to ensure the confidentiality of PHI. This Act can affect the ability of the Medical Data Sheet to contain and convey information you would want a Doctor to know if you were incapacitated. So before you complete the Medical Data Sheet understand that this form will not be maintained in a secure location. It will be maintained in a file box or binder accessible to other members of the field crew so that they can accompany an injured party to the hospital.

DO NOT include information that you do not wish others to know, only information that may be pertinent in an emergency situation or treatment.

Name (Print clearly)

Signature

Date

ATTACHMENT IV

ACCIDENT PREVENTION PLAN/ ACTIVITY HAZARD ANALYSIS

Accident Prevention Plan
For
Naval Support Activity Crane
Crane, Indiana

Submitted to:


Naval Facilities Engineering Command
Mid-West
201 Decatur Avenue Bldg. 1A
Great Lakes, IL 60088

Submitted by:

Tetra Tech NUS, Inc.
234 Mall Boulevard, Suite 260
King of Prussia, Pennsylvania 19406

August 2009

PREPARED UNDER THE SUPERVISION OF:


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APPROVED FOR SUBMISSION BY:



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ATTACHMENTS

- 1 Employee Training/Qualifications

LIST OF TABLES

- 1 Crane, IN Activity Hazard Analysis

ACRONYMS

§	Section
dB	decibels
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
BBP	Blood borne pathogen
BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
CPR	Cardiopulmonary resuscitation
CTO	Contract Task Order
DART	Days Away/Restricted Duty/Transfer
DDESB	Department of Defense Explosives Safety Board
DEET	N, N-diethyl-m-toluamide
EM	Engineer Manual
EMR	Experience modification rate
EOD	Explosive Ordnance Disposal
ESS	Explosive Safety Submission
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
MC	Munitions constituents
MEC	Munitions and explosives of concern
MPPEH	Material potentially presenting an explosive hazard
NAICS	North American Industry Classification System
NAVFAC MW	Naval Facilities Engineering Command Midwest
NEHC	Navy Environmental Health Center
NHSO	Navy Health and Safety Officer
NIOSH	National Institute of Occupational Safety and Health
NRR	Noise Reduction Rating
NSA Crane	Naval Support Activity Crane
OSHA	Occupational Safety and Health Administration
PHSO	Project Health and Safety Officer
PM	Project Manager
PPE	Personal protective equipment
RCIR	Recordable Case Incident Rate
RPM	Remedial Project Manager
SHM	Safety and Health Manager
SSC	Site Safety Coordinator
SUXOS	Senior UXO Supervisor
TP	Technical Paper

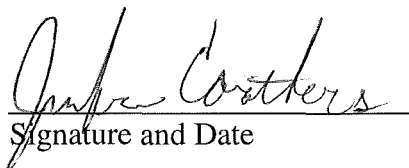
UST	Underground Storage Tank
UXO	Unexploded Ordnance
UXOSO/QC	Unexploded Ordnance Safety Officer/Quality Control

1.0 SIGNATURE SHEET

**NAVAL FACILITIES ENGINEERING COMMAND MID-WEST
CONTRACT NO. N62467-04-D-0055
ACCIDENT PREVENTION PLAN FOR
NAVAL SUPPORT ACTIVITY CRANE
CRANE, INDIANA**

Prepared by:

Jennifer Carothers, PhD
Tetra Tech NUS
Project Health and Safety Officer


Signature and Date

(412) 921-8083
Phone

Concurred by:

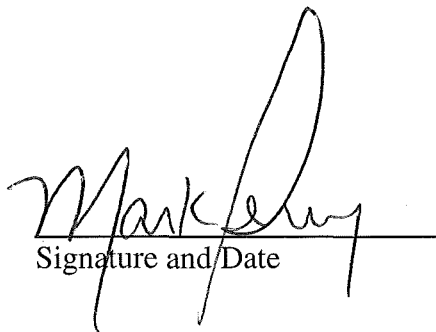
Matthew M. Soltis, CIH, CSP
Tetra Tech NUS
Safety and Health Manager


Signature and Date

(412) 921-8912
Phone

Approved by:

Mark Perry
Tetra Tech NUS
Company Officer


Signature and Date

(412) 921-7217
Phone

2.0 BACKGROUND INFORMATION

Contractor: Tetra Tech NUS

Contract Number: N62472-03-D-0057

Project Name: Sampling Investigation at Naval Support Activity Crane in Crane, Indiana

2.1 PROJECT DESCRIPTION

The objective of this task will be to implement field sampling activities at Naval Support Activity Crane in Crane, Indiana.

This Accident Prevention Plan (APP) addresses only the activities to be performed by Tetra Tech NUS personnel. Activities that will be performed by subcontractors are excluded and are to be addressed in safety and health planning documents prepared by that employer.

The site-specific health and safety provisions in this document have been developed for use during the provision of unexploded ordnance (UXO) avoidance support during the Naval Support Activity (NSA) Crane Site Inspection. This document addresses applicable items specified under the U.S. Army Corps of Engineers Safety and Health Requirements Manual, Engineering Manual (EM) 385-1-1, and United States Occupational Safety and Health Administration (OSHA) Title 29 of CFR, § 1910.120(b). This APP will be available to (1) all on-site personnel who may be exposed to hazardous on-site conditions, including Tetra Tech NUS and subcontractor personnel participating in field activities and UXO avoidance activities, and (2) all site visitors, including regulatory agency representatives. Site-specific sections of EM 385-1-1 applicable to this field effort are as follows:

- ☒ 1 - Program Management
- ☐ 2 - Sanitation
- ☒ 3 - Medical and First Aid Requirements
- ☐ 4 - Temporary Facilities
- ☒ 5 - Personal Protective and Safety Equipment
- ☒ 6 - Hazardous Substances, Agents, and Environments
- ☐ 7 - Lighting
- ☐ 8 - Accident Prevention Signs, Tags, Labels, Signals, Piping System ID, and Traffic Control
- ☒ 9 - Fire Prevention and Protection
- ☐ 10 - Welding and Cutting
- ☐ 11 - Electrical
- ☐ 12 - Control of Hazardous Energy
- ☐ 13 - Hand and Power Tools

- ☐ 14 - Material Handling, Storage, and Disposal
- ☐ 15 - Rigging
- ☐ 16 - Machinery and Mechanized Equipment
- ☐ 17 - Conveyors
- ☐ 18 - Motor Vehicles and Aircraft
- ☒ 19 - Floating Plant and Marine Activities
- ☐ 20 - Pressurized Equipment and Systems
- ☐ 21 - Safe Access and Fall Protection
- ☐ 22 - Work Platforms
- ☐ 23 - Demolition
- ☐ 24 - Floor and Wall Holes and Openings
- ☐ 25 - Excavations
- ☐ 26 - Underground Construction, Shafts, and Caissons
- ☐ 27 - Concrete and Masonry Construction and Steel Erection
- ☒ 28 - Hazardous Waste Operations and Emergency Response (HAZWOPER)
- ☐ 29 - Blasting
- ☐ 30 - Contract Diving Operations

2.2 SITE MAPS

A facility location map is included as and a site location map showing the location where Tetra Tech NUS employees will be performing work are included as part of the Work Plan for the work associated with this field effort at NSA Crane.

2.3 TETRA TECH NUS SAFETY STATISTICS

The following table presents safety statistics for Tetra Tech NUS for the last 3 calendar years compared to the national averages for our industry. This comparison uses data collected by the United States Dept. of Labor, Bureau of Labor Statistics (BLS), for different types of employers, segregated by North American Industry Classification System (NAICS) codes.

Comparison of Tetra Tech NUS and NAICS Code 562910 RCIR and DART Case Rates

	Remediation and other WMS 2007	TtNUS 2005	TtNUS 2006	TtNUS 2007	TtNUS 2008
Total Recordable Case Incident Rate (RCIR)	4.7	0.55	0.91	0.3	0.48
Days Away/Restricted Duty/Transfer Case Rate (DART)	3.22	0.27	0.30	0.3	0.24

NAICS Code 562910 – Remediation and other waste management services

The data comparison illustrate that Tetra Tech NUS' performance compares favorably with the most-recent national averages for the environmental engineering and hazardous waste services industries.

Tetra Tech NUS, Inc. Experience Modification Rates and OSHA Logs

Policy Year (October 1 - September 30) 2006-2007: 0.90

Policy Year 2007-2008: 0.92

Policy Year 2008-2009: 0.85

2.4 WORK PHASES

Work on this project will occur in the following phases. Associated dates when Tetra Tech NUS personnel will be on site performing work will be listed for each phase of the project.

Phase 1 - Mobilization

Phase 2 - UXO Support (avoidance) and field activities

Phase 3 - Demobilization

2.5 SPECIFIC SITE ACTIVITIES

The detailed Scope of Work for field activities to be performed during UXO support during the site investigation at NSA Crane will include the following tasks:

- Mobilization/demobilization
- UXO surface surveys of proposed areas for MEC
- Visual screening of sampling areas for MEC and MPPEH and sampling activities by Tetra Tech NUS

For each of these tasks, detailed Activity Hazard Analyses (AHAs) have been prepared and are provided in Section 14.0 of this APP.

3.0 STATEMENT OF SAFETY AND HEALTH POLICY

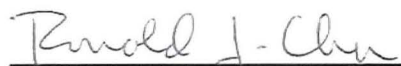
Tetra Tech NUS is committed to providing our employees with a safe and healthful workplace. The principal elements of our program are founded on the requirements presented in the Health and Safety Policy presented on the following page.

TETRA TECH NUS, INC. HEALTH AND SAFETY POLICY

Tetra Tech NUS, Inc., is committed to providing our employees with a safe and healthful workplace. We believe that occupational injuries and illness can be prevented; and we are convinced that a strong Health and Safety Program is essential to achieve this objective.

The principal elements of our program are founded on the requirements that our managers and employees:

- Recognize a *personal responsibility* for their own health and safety and for actions that affect the health and safety of fellow employees.
- Integrate safety and health into *all aspects* of their work, with the well-being of employees as the primary concern in all activities.
- Comply with applicable *federal, state, and local regulations*, as well as with our internal Corporate and our clients' safety and health policies and procedures.
- Take *an active role* in the Health and Safety Program by providing input and constructive criticism for improvements to the program.



Ronald J. Chu, PE
President



Matthew M. Soltis, CIH, CSP
Health and Safety Manager

 Tetra Tech NUS, Inc.
July 2007

4.0 RESPONSIBILITIES AND LINES OF AUTHORITY

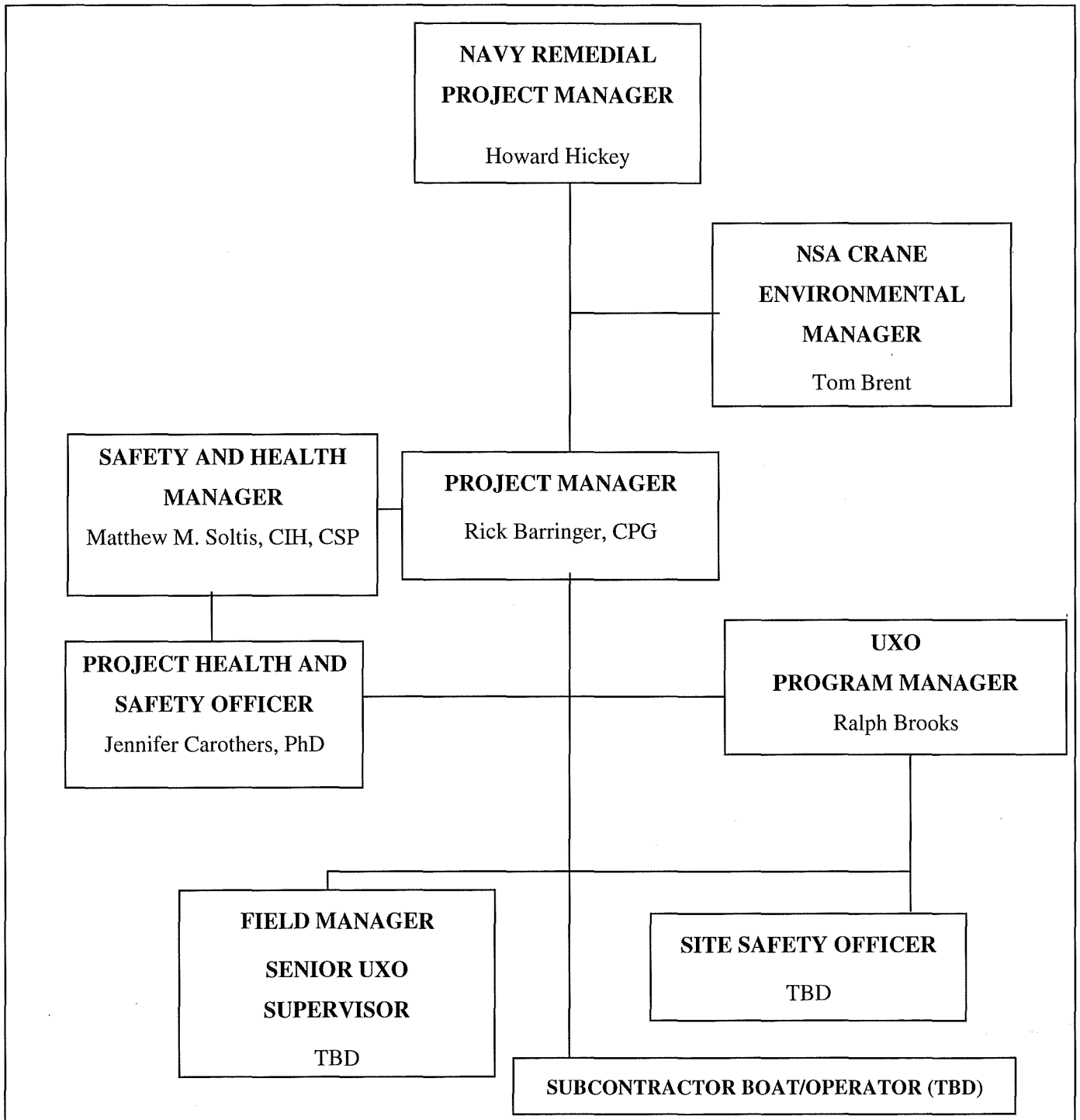
The Tetra Tech NUS Site Safety Officer (SSO) for this project has been appointed by the Project Manager (PM) and is responsible for field implementation of tasks and procedures contained in the HASP (see Section 15.0) portion of the APP. The SSC for this project may be the UXO Safety Officer/Quality Control (UXOSO/QC) technician on site. The SSO has completed 40-Hour HAZWOPER and subsequent 8-Hour HAZWOPER Refresher Training, 8-Hour HAZWOPER Supervisor Training, and First Aid/CPR and Blood-borne Pathogen training in accordance with regulatory requirements applicable to the work that will be performed for this project. The Tetra Tech NUS SSO has primary responsibility for responding to and correcting emergency situations and for taking appropriate measures to ensure the safety of site personnel and the public (e.g., evacuation of personnel from the site area). The SSO is also responsible for ensuring that corrective measures have been implemented, appropriate internal and Navy authorities have been notified, and follow-up reports have been completed.

Individual subcontractors are required to cooperate with the SSO within the parameters of their Scopes of Work.

Personnel are required to immediately report all injuries, illnesses, spills, fires, and property damage to the SSO. The SSO must be notified of any on-site emergencies and is responsible for ensuring that the appropriate emergency procedures described in this section are followed. The SSC is also responsible for informing the Navy Remedial Project Manager (RPM) of major incidents and associated corrective actions.

Management at Tetra Tech NUS has the authority and responsibility for implementing and maintaining this APP and HASP. Specific responsibilities are discussed in Section 15. An organization chart presenting the lines of authority for this project is shown on the next page.

**ORGANIZATION CHART
ON-SITE SUPPORT OF
MRP FIELD ACTIVITIES AT NSA CRANE**



All work under this contract, including this field effort, is subject to a comprehensive health and safety program developed, designed, and implemented by Matthew M. Soltis, CIH, CSP. Mr. Soltis serves as Director of Health and Safety for Tetra Tech NUS and as the Safety and Health Manager (SHM) for the planned work addressed in this APP.

5.0 SUBCONTRACTORS

Tetra Tech NUS may employ a subcontractor in the performance of work covered by this APP.

Any subcontractor participating at work at NSA Crane are required to prepare and adhere to safety planning and program documents (e.g., APP, HASP, etc.) as appropriate for the activities that they will perform on this project site. In addition, subcontractor personnel will also be required to read and comply with all sections of this Tetra Tech NUS APP and HASP. All subcontractor personnel entering the site must sign the Site-Specific Training Documentation form included in the HASP. Subcontractor personnel must comply with all applicable 29 CFR §1910.120 training and medical surveillance requirements. Subcontractors are responsible for providing personal protective equipment (PPE) needed to protect personnel as specified by their safety and health planning documents and by this APP, and are directly responsible for assuring the health and safety of their employees. Subcontractors who have not met OSHA training, medical surveillance, and PPE requirements are not permitted to enter areas where exposure to hazardous materials is possible.

This APP and associated HASP shall be rigorously enforced during this field effort. Violators of the HASP will be verbally notified upon first violation, and the violation will be noted by the Tetra Tech NUS SSO in a field logbook. Upon second violation, the violator will be notified in writing, and the Tetra Tech NUS PM and the violator's supervisor will be notified. A third violation will result in a written notification and the violator's eviction from the sites. The written notification will be sent to the human resources development and the SHM.

IMPORTANT NOTE: Any violations that are deemed to be serious, intentional, or otherwise egregious will be subject to immediate corrective action, up to and including removal from the site, and will not require adherence to this progressive, three-step disciplinary process.

Personnel will be encouraged to report to the SSO any conditions or practices that they consider detrimental to their health or safety, or those they believe violate applicable health and safety standards. Such reports may be made orally or in writing. Personnel who believe that an imminent danger threatens human health or the environment are encouraged to bring the matter to the immediate attention of the SSO for resolution. Job site activities presenting danger to life or limb should be stopped immediately and reported to the SSO for resolution.

At least one copy of this APP and the HASP will be available to site personnel at all times. Each vehicle taken to the job site will contain a copy of the APP and the HASP to ensure quick and easy access by employees. Minor changes in the HASP procedures will be discussed at the beginning of each work day by the SSO at the daily tailgate safety meeting. Significant HASP revisions must be discussed with the SHM and PM and approved via the HASP amendment form.

6.0 TRAINING

Site personnel who may be exposed to hazardous conditions and who will participate in on site activities are required to meet the training requirements outlined in 29 CFR §1910.120, Hazardous Waste Operations and Emergency Response. Furthermore, site personnel must satisfy any specialized training requirements that are presented in the AHAs for tasks to be completed under this Contract Task Order (CTO).

6.1 MANDATORY TRAINING AND CERTIFICATIONS

Tetra Tech NUS personnel qualification and training certification documentation will be obtained by the PM/FOL and included in Attachment 1 of this APP, and a copy maintained on site. Mandatory training and certifications applicable to this project include the following:

- HAZWOPER as outlined in 29 CFR § 1910.120
- Current 8-hour HAZWOPER refresher
- All supervisory personnel will also have Supervisory Training in accordance with 29 CFR 1910.120(e)(4)
- As indicated above, these are base training requirements necessary to be on the site. Specialized operations (UXO) or responsibilities (Blood-borne pathogen-First Aid) will also require additional training for personnel filling those roles.

6.2 SITE-SPECIFIC SAFETY AND HEALTH TRAINING

Prior to accessing active work areas of the sites or participating in any intrusive activities, site personnel and visitors will first be required to undergo a site-specific safety and health training session conducted by the SSO, which will include a review of the HASP and signing of the Site-Specific Training Documentation form. Site workers will be required to sign a Daily Tailgate Safety Meeting form (included in HASP).

In addition, UXO team members on site will meet or exceed the requirements stated in the Department of Defense Explosives Safety Board (DDESB) Technical Paper (TP) 18 for their respective assignments.

Before on-site activities begin, the Tetra Tech NUS SSO will present a briefing for all personnel who will participate in on-site activities. The following topics will be addressed during the pre-work briefing:

- Names of the SSO and designated alternate
- Site history
- Work tasks
- Hazardous chemicals that may be encountered on site
- Physical hazards that may be encountered on site
- PPE, including types of respiratory protection to be used for work tasks
- Mandatory training and certification requirements (e.g., HAZWOPER; HAZWOPER 8-hour Refresher; MEC-specific)
- Environmental surveillance (air monitoring) equipment use and maintenance
- Action levels and situations requiring an upgrade or downgrade of level of protection
- Site control measures including site communications and control zones
- Decontamination procedures
- Emergency communication signals and codes, including incident reporting procedures
- Environmental accident emergency procedures (in case contamination spreads outside the exclusion zone)
- Personnel exposure and accident emergency procedures (in case of falls, exposure to hazardous substances, and other hazardous situations)
- Fire and explosion emergency procedures
- Emergency telephone numbers
- Emergency routes

Any other health and safety-related issues that may arise before site activities begin will also be discussed during the pre-work briefing by the SSO.

Issues that arise during implementation of on-site activities will be addressed during tailgate safety meetings to be held daily before the workday or shift begins and will be documented in a Daily Tailgate Safety Meeting form (included in the HASP). The tailgate safety meetings will be attended by site workers, subcontractors, and visitors and will be conducted by the PM and/or

SSO. Any changes in procedures or site-specific health and safety-related matters will be addressed during these meetings.

All emergency situations require follow-up and reporting. In addition to immediate reporting to the SSO and/or PM, an Incident Report Form must be completed, signed by the PM, SSO, and the employee's Office Manager, and submitted to the Tetra Tech NUS SHM within 24 hours of an emergency situation. The report must include proposed actions to prevent similar incidents from occurring in the future. The SHM must be fully informed of the corrective action process so that the SHM may implement applicable elements of the process at other sites.

Emergency situations must also be reported to the Navy RPM. Contact information for these individuals is listed in the HASP.

7.0 SAFETY AND HEALTH INSPECTIONS

It is Tetra Tech NUS's internal policy that all job sites involving work for Naval Facilities Engineering Command Midwest (NAVFAC MW) are subject to audits by corporate safety staff. Daily site safety inspections shall be conducted by the Tetra Tech NUS SSO during this field effort to ensure safe work areas and compliance with the HASP.

All items noted during field audits will be communicated to the Tetra Tech NUS SHM who maintains a corrective/preventive action database. Responsibility for resolving each item noted during these audits is assigned and tracked through resolution. Results from field audits are also regularly communicated throughout Tetra Tech NUS through training and electronic means as a method of continuous program improvement.

8.0 SAFETY HEALTH EXPECTATIONS AND COMPLIANCE

It is the goal of Tetra Tech NUS to continue excellent safety performance on all NAVFAC MW contracts to support the Navy in their safety efforts. Specifically, Tetra Tech NUS will perform all work in a manner that is consistent with the Zero Incident philosophy. In accordance with this philosophy, it is our stated goal to plan and perform all work in a manner that integrates safety and health considerations so that it is accomplished without experiencing any worker injuries or illnesses, environmental releases/impacts, or property damage events.

In addition to the line and staff management functions described in this APP and the accompanying HASP, each individual performing work under this contract has the responsibility for their own personal health and safety, as well as assisting in assuring the health and safety of their co-workers. This element is also the first one listed in our corporate Health and Safety Policy Statement, which requires that "each employee recognize a *personal* responsibility for their own health and safety and for actions that affect the health and safety of fellow employees."

This employee responsibility includes observing specified health and safety requirements and communicating with the designated SSO on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues.

An employee's failure to adhere to the requirements of this APP and HASP or to observe specified safety requirements and restrictions or to properly use identified protective equipment may lead to injury or illness. As a result, deviation from safety and health procedures is not tolerated. Failure to comply with health and safety procedures and requirements will lead to reprimand up to and including dismissal.

Health and safety-related information will be communicated to employees through meetings, postings, written communications, and reporting of hazards.

9.0 INCIDENT REPORTING

Accidents or incidents as well as near-miss events are to be reported using the Tetra Tech NUS incident reporting process and forms. See Section 15.0 for detailed information on incident reporting. The SHM is responsible for assuring that all incidents and serious near-miss events are adequately investigated and is also responsible for collecting, tracking, and trending incident data (e.g., recordable cases, employee hours worked, etc.). Accidents involving near misses, injuries, or illnesses must be immediately reported to the PM and the SHM, and documented on the Tetra Tech NUS Incident Report (in the HASP). Forms must be reviewed by the PM and the SSO.

Hazardous work conditions or unsafe work practices will be corrected in a timely manner, both in the field and in the office. Upon discovery of an unsafe condition at a field site, the degree of hazard must be assessed and action may range from complete shutdown of the operation to phased correction. All Tetra Tech NUS employees working on this project will have "Stop Work" authority in the event that a potentially serious action or condition is observed. Tetra Tech NUS will shut down a project during which life threatening, severe environmental impact, or significant equipment or property damage conditions may exist. Employees shall follow specific information for emergency evacuation and PPE usage as described in this APP and associated HASP. The PM and Navy RPM must be contacted regarding each incident.

10.0 MEDICAL SUPPORT

As required by EM 385-1-1, Tetra Tech NUS will ensure that a minimum of two people have current certifications in CPR, First Aid, and Blood-borne Pathogens. The two people with current training are the Senior UXO Supervisor (SUXOS) and the SSO. Other than rendering basic CPR and First Aid, these employees are not expected to perform emergency medical duties. However, they are authorized to perform emergency rescue or other duties up to the level of their training.

Emergency medical assistance will be acquired from non-Navy sources. The closest hospital to the site is Bedford Medical Center. Directions to this hospital are included in the HASP, as well as contact numbers for both the hospital and ambulance services. Tetra Tech NUS personnel are instructed to perform a drive-by of the nearest hospital to ensure that it is accessible and available and that the most efficient route is well mapped.

11.0 PERSONAL PROTECTION REQUIREMENTS

The levels of personal protection to be used for work tasks at the NSA Crane site have been selected based on the nature of the planned work activities and on the known or anticipated hazards; types and concentrations of contaminants that may be encountered on site; and contaminant properties, toxicity, exposure routes, and matrixes. Specific PPE selected for this project is listed, by task, in the AHAs located in Section 14.0 of this APP.

PPE is selected by the PHSO when writing the APP and HASP, and is confirmed through a rigorous review process by the Tetra Tech NUS SHM. To assure proper PPE has been selected, both the physical and chemical hazards present at the job site are taken into account in both developing and reviewing safety-related documents. In lieu of a separate hazard assessment document being developed by Tetra Tech NUS for Navy field efforts, the signatures of the SHM and the PHSO on the Signature Page of this APP constitute approval of the hazard assessment contained in the HASP.

The anticipated levels of protection selected for use by field personnel during site activities is Level D. If site conditions or the results of air monitoring performed during site activities warrant a higher level of protection, all field personnel will withdraw from the site, immediately notify the Tetra Tech NUS SSO, and obtain further instructions.

PPE levels can be upgraded or downgraded based on a change in site conditions or investigation findings. When a significant change in site conditions occurs, hazards will be reassessed. Some indicators of the need for reassessment are discussed in Section 15.0.

PPE has been selected based on the results of task-specific hazard assessments. Through the completion of employee training (e.g., introductory 40-hour hazardous waste training, annual refresher training, etc.), Tetra Tech NUS employees have been informed of the proper selection, use, and care of PPE items provided to them. After PPE is provided to an employee, the responsibility for using and caring for it appropriately is the responsibility of that employee. The SSO is responsible for assuring that these responsibilities are fulfilled through daily observations and work area inspections at the sites. The SSC is also responsible for assuring that appropriate and adequate supplies of PPE are maintained such that they are readily available for issuance/replacement and in a clean and sanitary manner and location. All site personnel will use the procedures presented in Section 15.0 to obtain optimum performance from PPE.

12.0 APPLICABLE SITE SPECIFIC PLANS, PROGRAMS AND PROCEDURES

Listed below are potential site-specific plans and procedures that may be applicable to this Navy field effort. The required plans and safety procedures are included in the HASP, APP, or as attachments to this APP.

- ☐ Layout Plan
- ☒ Emergency Response Plan
- ☐ Spill Plan
- ☒ Firefighting Plan
- ☒ Posting of Emergency Telephone Numbers
- ☐ Wildfire Prevention Plan
- ☒ Man Overboard – Abandon Ship
- ☒ Hazard Communication Program
- ☐ Respiratory Protection Plan
- ☒ Health Hazard Control Program
- ☐ Lead Abatement Plan
- ☐ Asbestos Abatement Plan
- ☐ Abrasive Blasting Plan
- ☐ Confined Space Entry Plan
- ☐ Hazardous Energy Control Plan
- ☐ Critical Lift Procedure
- ☐ Contingency Plan for Severe Weather
- ☐ Access and Haul Road Plan
- ☐ Demolition Plan (engineering and asbestos surveys)
- ☐ Emergency Rescue (tunneling)
- ☐ Underground Construction Fire Prevention and Protection Plan
- ☐ Compressed Air Plan
- ☐ Formwork and Shoring Erection and Removal Plan
- ☐ Jacking Plan (lift) Slab Plan
- ☒ Health and Safety Plan
- ☐ Blasting Plan
- ☐ Diving Plan
- ☐ Prevention of Alcohol and Drug Abuse
- ☐ Fall Protection Plan
- ☐ Steel Erection Plan
- ☐ Night Operations Lighting Plan
- ☐ Site Sanitation Plan
- ☐ Fire Prevention Plan

13.0 CONTRACTOR (TETRA TECH NUS) INFORMATION

Tetra Tech NUS's HASP must accompany this APP on job sites at all times. The HASP contains information specific to the NSA Crane effort and provides requirements that employees

must follow to ensure that their activities are carried out in accordance with both OSHA and applicable EM 385-1-1 requirements. Compliance with the HASP by Tetra Tech NUS will be the means used to meet the requirements outlined in this APP.

Additionally, site-specific AHAs (Section 14.0) have been developed that comply with OSHA requirements and EM 385-1-1 requirements. By adhering to requirements specified in the AHAs, work will be performed on site in a safe manner. Minor changes to AHAs based on actual site conditions are permitted as necessary and applicable by the SSO in the field. Major changes to AHAs, such as Scope of Work changes, must be documented on a revised AHA forms and are subject to additional review by the Tetra Tech NUS SHM.

14.0 SITE-SPECIFIC HAZARDS AND CONTROLS

Detailed task-specific hazards and controls are provided in the AHAs attached to this APP. Table 1 details the AHAs for the UXO activities being provided in support of the NSA Crane field activities.

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
<p>Mobilization/Demobilization:</p> <p>Assembling, packing, unpacking equipment and supplies</p> <p>Performing a Jobsite Hazard Evaluation and initial/exit inspections of the intended work areas.</p> <p>Performing initial clearance of travel pathways (foot/vehicular).</p>	<p>1. Minor cuts, abrasions, or contusions handling equipment and tools</p>	<p>1. Wear cut-resistant gloves when handling items with sharp or rough edges.</p>
	<p>2. Heavy lifting (muscle strains and pulls)</p>	<p>2. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure a clear path of travel and good grasp on object. Lift with legs not back, obtain help when needed to lift large, bulky, or heavy items).</p>
	<p>3. Vehicular traffic at the work site</p>	<p>3. Locate vehicle and equipment staging areas. Inform site personnel of equipment areas and of their responsibility to stay clear of moving vehicles. Observe designated and marked travel pathways. Wear safety vests when activities involve encroaching on active traffic ways.</p>
	<p>4. Intermittent high noise levels</p>	<p>4. Although not considered a highly probable event, based on the anticipated activities, the use of hearing protection may occasionally be required (at the onsite SSO's/UXOS's discretion). The SSO or the SUXOS will observe the following:</p> <p><i>Available data or monitoring results collected from similar operations and/or collected during this activity.</i></p> <p><i>Use of hearing protection within an established distance from an operation potentially generating excessive noise levels until these levels can be quantified. For instance, during the operation of heavy equipment (excavator) typical site control boundary will be the length of the boom/bucket plus 10- feet. This is a sufficient distance to remove personnel from excessive noise levels. Inside this boundary personnel will wear hearing protection.</i></p> <p><i>Lastly, the employees may utilize the following general rule of thumb to help make these determinations:</i></p> <p><i>If noise levels are such that a worker must raise their voice to communicate with someone who is within arm's reach (approximately 2 feet) of them, excessive noise levels are being approached and hearing protection is required.</i></p> <p><i>Hearing protection will consist of either ear muffs or ear plugs that have a Noise</i></p>

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
		<i>Reduction Rate (NRR) of at least 25 decibels (dB).</i>
	5. Slip/trip/fall hazards	5. Implement and maintain good housekeeping practices throughout work areas. Preview walking/working areas and maintain them to identify and avoid when possible slipping/tripping hazards. Preview work locations for unstable/uneven terrain.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Hand tools (dollies, hand carts, hand knives, shovels, etc.)	<p>Visual inspection of hand tools prior to use by user.</p> <p>The Senior UXO Supervisor (SUXOS) is to perform regular inspections for housekeeping issues and surveys of operational areas to insure compliance with the HASP.</p>	None required.

TABLE 1

NWSC CRANE ACTIVITY HAZARD ANALYSIS

ACTIVITY: UXO Avoidance Prior to Field/Sampling Activities

ANALYZED BY/DATE: J Choich 7/09

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
UXO Surface Survey – Identifying MEC/UXO materials on the surface/near surface	<p>1. Injury due to contact with operating equipment, if applicable. These include the following potential hazards:</p> <ul style="list-style-type: none"> • Eye injury • Foot injury • Intermittent noise 	<p>1. Be aware of safe work zones and use the designated routes of approach at the sites.</p> <ul style="list-style-type: none"> • Only authorized and essential personnel will be permitted in the work area. • Heavy equipment such as the excavator and earthmoving trucks will be equipped with movement warning systems (audible and/or visual). • Wear safety vest when working near heavy equipment. • Hard hats, safety impact eye protection, and safety toe safety footwear must be worn in areas where heavy equipment is actively operating. If safety toe footwear cannot be worn because of interferences with UXO detection devices, safety impact footwear with non-metallic toe protection (provided that the footwear satisfies ANSI Z-41 requirements for protective footwear) shall be used. • Hearing protection will be worn at the discretion of the SSO's/SUXOS. The following general rule of thumb applies: <i>If noise levels are such that a worker must raise their voice in order to communicate with someone who is within arm's reach (approximately 2 feet) of them, excessive noise levels are being approached and hearing protection is required. Hearing protection will consist of either ear muffs or ear plugs that have an NRR of at least 25 dB</i>
	<p>2. If operating heavy equipment is not present during this task, then potential hazards would be limited to:</p> <ul style="list-style-type: none"> • Insect/animal bites 	<p>2. Tape up joint between the bottom of pants legs and top of work boot with duct tape. Apply insect repellants containing at least 10 percent DEET. Follow manufacturer's label instructions for proper application and re-application. Perform close body inspections at the end of each day to detect/remove any insects. If walking through high grass or brush areas, wear snake chaps and avoid approaching or disturbing potential nesting areas.</p> <p>If electrical storms or inclement weather are in the area, as determined through local forecasting or weather alerts issued, the SUXOS will suspend outside activities. The 30-30 rule shall be applied, which is "if a time interval of 30 seconds or less is between lightning and its thunder, go inside</p>

TABLE 1

NWSC CRANE ACTIVITY HAZARD ANALYSIS

ACTIVITY: UXO Avoidance Prior to Field/Sampling Activities

ANALYZED BY/DATE: J Choich 7/09

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
	<ul style="list-style-type: none"> Inclement weather 	<p>(building/vehicle) and stay inside for at least 30 minutes.” If no additional lightning and/or thunder is noted within this 30 minutes, work may resume at the SSO's/SUXOS's direction. Personnel will be directed to seek suitable shelter that will provide adequate protection from the elements. Lightning threat detection will be coordinated within NSA Crane's existing systems.</p>
	3. MEC/UXO/MPPEH Hazards	<p>3. MEC/UXO/MPPEH operations will be conducted by trained UXO Technicians. Non-UXO personnel will be clear of the area during initial sweeps and excavation operations. Exclusion zone distances will be defined based on those specified in the Work Plan. Magnetometers will be tested using inert MEC/surrogates similar in size to suspected target anomalies. Any MEC/UXO/MPPEH items on the surface and near surface will be treated or flagged for UXO avoidance. UXO Technicians will clear vehicle and foot travel paths within the area. Support personnel and equipment will wait until the clearance is complete.</p> <p>If MEC/MPPEH is observed, the UXO Technician making the observation will signal to stop operations and take the following precautions:</p> <ul style="list-style-type: none"> The UXO Technician will visually inspect the MEC/MPPEH. MEC/MPPEH will not be moved or disturbed during this phase of the investigation. This identification and the exact location will be recorded in the logbook. Any MEC/MPPEH discovered during UXO Surface Survey operations will be flagged for UXO avoidance as stated in the Work Plan/ESS Determination. The SUXOS will notify the NSA Crane Explosions Safety Officer. MEC/MPPEH items discovered will be reported to the Navy RPM. An inventory will be maintained by the SUXOS with locations, and descriptions for the MEC/MPPEH discovered during this operation, and the Navy RPM will be provided an update about the inventory on a daily basis.

TABLE 1

NWSC CRANE ACTIVITY HAZARD ANALYSIS

ACTIVITY: UXO Avoidance Prior to Field/Sampling Activities

ANALYZED BY/DATE: J Choich 7/09

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
	4. Strains/sprains from heavy or improper lifting	4. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure a clear path of travel and good grasp on objects, lift with legs not back, obtain help when needed to lift large, bulky, or heavy items).
	5. Slip/trip/fall hazards	5. Implement and maintain good housekeeping practices throughout work areas. Preview walking/working areas and maintain them to identify and avoid possible slipping/tripping hazards. Preview work locations for unstable/uneven terrain.
	6. Electrical storms/ inclement weather (high winds, heavy rains, etc.)	6. If electrical storms or inclement weather are in the area as determined through local forecasting or weather alerts issued, the SUXOS will suspend outside activities. The 30-30 rule shall be applied, which is "if a time interval of 30 seconds or less is between lightning and its thunder, go inside (building/vehicle) and stay inside for at least 30 minutes." If no additional lightning and/or thunder is noted within this 30 minutes work may resume at the SSO's/SUXOS's direction. Personnel will be directed to seek suitable shelter that will provide adequate protection from the elements. Lightning threat detection will be coordinated within NSA Crane's existing systems.

TABLE 1

NWSC CRANE ACTIVITY HAZARD ANALYSIS

ACTIVITY: UXO Avoidance Prior to Field/Sampling Activities

ANALYZED BY/DATE: J Choich 7/09

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>Personal Protective Equipment:</p> <p><u>Minimum:</u></p> <ul style="list-style-type: none"> Safety toe boots, hard hats, and safety impact eye protection (when in active heavy vehicle operation areas or when handling heavy boxes and/or containers) Work gloves Work clothes <p><u>Optional items:</u></p> <ul style="list-style-type: none"> Hearing protection at SSO/SUXOS discretion High-visibility vests when near active traffic areas. For UXO Technicians - Safety toe/shank boots are required when working in areas where there is a danger of foot injuries due to falling or rolling objects or of objects piercing the sole. If safety toe footwear cannot be worn because of interferences with UXO 	<p>Initial PPE inspection performed by the SUXOS. Ongoing (prior to each use) inspections are the responsibility of PPE users.</p>	<p>PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40-hour HAZWOPER training, which is to be verified by the SUXOS through initial training documentation and reviewed prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.</p> <p>Explosive handling and transportation is not anticipated. If required this task will be conducted by qualified UXO Technicians. Therefore, this training and background is considered sufficient for this task.</p>

TABLE 1

NWSC CRANE ACTIVITY HAZARD ANALYSIS

ACTIVITY: UXO Avoidance Prior to Field/Sampling Activities

ANALYZED BY/DATE: J Choich 7/09

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>detection devices, safety impact footwear with non-metallic toe protection (provided that the footwear satisfies ANSI Z-41 requirements for protective footwear) shall be used.</p> <p>HTRW: none</p>		

*Accident Prevention Plan,
Crane, IN*

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ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
1. Land sampling activities, including UXO avoidance during sampling activities-identifying materials as not MEC/MPPEH-related prior to sampling.	1. MEC/MPPEH Hazards	<p>1. MEC/MPPEH avoidance operations will be conducted by trained UXO Technicians. Non-UXO personnel will be escorted while in the area of concern. The site investigation team will be accompanied by a UXO Technician II or higher during all fieldwork and intrusive operations. Exclusion zone distances will be defined based on those specified in the Work Plan. Operations will immediately stop if MEC/MPPEH is discovered and UXO Technicians will secure the area. All non-UXO personnel will leave the area.</p> <p>If MEC/MPPEH is observed, the UXO Technician making the observation will signal to stop operations and take the following precautions:</p> <ul style="list-style-type: none"> The UXO Technician will inspect the MEC/MPPEH to determine its condition, if possible. No suspect MEC/MPPEH will be moved or disturbed during this phase of the investigation. This identification and the exact location will be recorded in the logbook. Any MEC/MPPEH item discovered during UXO Surface Survey operations will be flagged for UXO avoidance as stated in the Work Plan/ESS Determination. The SUXOS will notify the NSA Crane Explosives Safety Officer. MEC/MPPEH items discovered will be reported to the Navy RPM. An inventory will be maintained by the SUXOS with locations, and descriptions for the MEC/MPPEH discovered during this operation, and the Navy RPM will be provided an update about the inventory on a daily basis. If at any time during the sampling activities, MEC, suspect MEC, MPPEH, or munitions debris are discovered in the excavation area, all operations will stop and the item will be reported.
2. Sampling activities from a boat.		
	3. Insect/animal bites	3. Tape up joint between bottoms of pant legs and top of work boot with duct tape. Apply insect repellants containing at least 10 percent DEET. Follow manufacturer's label instructions for proper application and re-application. Perform close body inspections at the end of each day to detect/remove any insects. If walking through high grass or brush

TABLE 1
NWSC CRANE ACTIVITY HAZARD ANALYSIS

ACTIVITY: Sampling Activities, including UXO Avoidance During Land Sampling Activities and Sampling Activities from a Boat and XRF
ANALYZED BY/DATE: J Choich 7/09

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
	4. Inclement weather	<p>areas, wear snake chaps and avoid approaching or disturbing potential nesting areas.</p> <p>4. If electrical storms or inclement weather are in the area, as determined through local forecasting or weather alerts issued, the SUXOS will suspend outside activities. The 30-30 rule shall be applied, which is "if a time interval of 30 seconds or less is between lightning and its thunder, go inside (building/vehicle) and stay inside for at least 30 minutes." If no additional lightning and/or thunder is noted within this 30 minutes, work may resume at the SSO's/SUXOS' direction. Personnel will be directed to seek suitable shelter that will provide adequate protection from the elements. Lightning threat detection will be coordinated within NSA Crane's existing systems.</p>

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ACTIVITY: Sampling Activities, including UXO Avoidance During Land Sampling Activities and Sampling Activities from a Boat and XRF
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EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>Personal Protective Equipment:</p> <p><u>Minimum:</u></p> <ul style="list-style-type: none"> Safety toe boots, hard hats, and safety impact eye protection (when in active heavy vehicle operation areas or when handling heavy boxes and/or containers) Work gloves Work clothes <p><u>Optional items:</u></p> <ul style="list-style-type: none"> Hearing protection at SSO/SUXOS's discretion High-visibility vests when near active traffic areas. <p>Other equipment:</p> <ul style="list-style-type: none"> For UXO Technicians - Safety toe/shank boots are required 	<p>Initial PPE inspection performed by the SUXOS. Ongoing (prior to each use) inspections are the responsibility of PPE users.</p>	<p>PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40-hour HAZWOPER training, which is to be verified by the SUXOS through initial training documentation and reviewed prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.</p> <p>Explosive handling and transportation is not anticipated. If required this task will be conducted by qualified UXO Technicians. Therefore, this training and background is considered sufficient for this task.</p>

TABLE 1
NWSC CRANE ACTIVITY HAZARD ANALYSIS

ACTIVITY: Sampling Activities, including UXO Avoidance During Land Sampling Activities and Sampling Activities from a Boat and XRF
ANALYZED BY/DATE: J Choich 7/09

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>when working in areas where there is a danger of foot injuries due to falling or rolling objects or objects piercing the sole. If safety toe footwear cannot be worn because of interferences with UXO detection devices, safety impact footwear with non-metallic toe protection (provided that the footwear satisfies ANSI Z-41 requirements for protective footwear) shall be used.</p> <ul style="list-style-type: none"> • Sampling equipment • USCG approved boat • XRF <p><u>HTRW</u>: none</p>		<p>Technician skilled and trained in XRF.</p>

15.0 HEALTH AND SAFETY PLAN

This APP is an attachment to the site-specific HASP and this document as a whole (HASP and APP) will be submitted to the Navy Environmental Health Center (NEHC) for review and comment.

16.0 BOATING SAFE WORK PRACTICES

As some of the site investigation activities will be conducted on a boat, the Boating Safe Work Practices will be followed, as discussed in Section 5.3 of the HASP.

17.0 REFERENCES

United States Army Corps of Engineers (USACE). 2008. Engineer Manual (EM) 385-1-1, Safety and Health Requirements Manual. It is available online at:
<http://www.usace.army.mil/inet/usace-docs/eng-manuals/em385-1-1/entire.pdf>

ATTACHMENTS TO ACCIDENT PREVENTION PLAN

Attachment 1

Employee training/qualifications to be attached by PM/FOL

(40-Hour HAZWOPER Certificates; 8-Hour HAZWOPER Refresher Certificates; First Aid/CPR Certificates; Employee Resumes as required)

ATTACHMENT V
BOAT SAFETY CHECKLIST

TETRA TECH NUS, INC.
SAFE BOATING CHECKLIST

Owner/Operator Name: _____

Registration Number _____

Location _____ County: _____ State: _____ HIN: _____

Length of Boat: <16 ☐ 16-25 ☐ 26-39 ☐ 40-65 ☐ > 65 ☐

Area of Operations: Inland ☐ Coastal ☐

Powered by: Gas ☐ Diesel ☐ Sail ☐ Other ☐

Type: PWC ☐ Open ☐ Cabin ☐ Other ☐

VESSEL SAFETY CHECK REQUIREMENTS				RECOMMENDED AND DISCUSSION ITEMS			
Item	Yes	No	NA	Item	Yes	No	NA
1. Display of Numbers				(While encouraged, items below are not requirements)			
2. Registration / Documentation				I. Marine Radio			
3. Personal Flotation Devices (PFD)				II. Dewatering Device & Backup			
4. Visual Distress Signals (VDS)				III. Mounted Fire Extinguishers			
5. Fire Extinguishers				IV. Anchor & Line for Area			
6. Ventilation				V. First Aid and PIW Kits (**over)			
7. Backfire Flame Control				VI. Inland Visual Distress Signals			
8. Sound Producing Devices / Bell				VII. Capacity / Cert. of Compliance			
9. Navigation Lights				VIII. Discussion Items: (as applies)			
10. Pollution Placard				a. Accident reporting/owner responsibility			
11. MARPOL Trash Placard				b. Offshore operations			
12. Marine Sanitation Devices				c. Nautical charts / navigation aids			
13. Navigation Rules				d. Survival tips / first Aid			
14. State and/ or Local Requirements				e. Fueling / fuel management			
15. Overall Vessel Condition:				f. Float plan / weather & sea conditions			
a. Deck free of hazards / clean bilge				g. Insurance considerations			
b. Electrical / fuel systems				h. Boating check list			
c. Galley / heating systems				i. Safe boating classes			

This checklist has been modified for use from the United States Coast Guard Auxiliary Vessel Safety Check (VSC) Program. USCG AUX. Form 204 (7-2000)

Explanation of Required Items

- ❑ **1. NUMBERING:** The boat's registration number must be permanently attached to each side of the forward half of the boat. Characters must be plain, vertical, block style, not less than three (3) inches high, and in a color contrasting with the background. A space or hyphen must separate the letters from the numbers.

- ❑ **2. REGISTRATION / DOCUMENTATION:** Registration or Documentation papers must be on board and available. Documentation numbers must be permanently marked on a visible part of the interior structure. The documented boat's name and hailing port must be displayed on the exterior hull in letters not less than 4 inches in height.

- ❑ **3. PERSONAL FLOTATION DEVICES (PFDs):** Acceptable PFDs (also known as Life Jackets) must be U.S. Coast Guard approved and in good, serviceable condition. A wearable PFD of suitable size is required for the each person on the boat. Wearable PFDs shall be "*readily accessible.*" Boats 16 Feet or longer, must also have one Type IV (throwable) device, which shall be "*immediately available.*" PFDs shall NOT be stored in unopened plastic packaging.

- ❑ **4. VISUAL DISTRESS SIGNALS:** Boats 16 feet and over or the are required to carry a minimum of either:
 - 1) three day and three night pyrotechnic devices
 - 2) one day non-pyrotechnic device (flag) and one night non-pyrotechnic device (auto SOS light)
 - 3) a combination of 1) and 2).
 Boats less than 16 feet need only carry night visual distress signals when operating from sunset to sunrise. It is recommended, but not required, that boats operating on inland waters should have some means of making a suitable day and night distress signal. The number and type of signals is best judged by considering conditions under which the boat will be operating.

- ❑ **5. FIRE EXTINGUISHERS:** Fire extinguishers are required if one of the following conditions exists:
 - 1) Inboard engine(s)
 - 2) Double bottom hulls not completely sealed or not completely filled with flotation materials
 - 3) Closed living space
 - 4) Closed stowage compartments that contain flammable materials or
 - 5) Permanently installed fuel tanks. Boats less than 26 feet, and propelled by outboard motors are NOT required to have fire extinguishers unless one or more of the conditions (2-5) listed above applies.

Coast Guard Classification of Fire Extinguishers		
Classification (type size)	B-I	B-II
Foam (minimum gallons)	1.25	2.5
Carbon Dioxide (minimum lbs.)	4	15
Dry Chemical (minimum lbs.)	2	10
Halon (minimum lbs.)	2.5	10

NOTE: Fire extinguishers must be readily accessible and verified as serviceable.

MINIMUM NUMBER OF EXTINGUISHERS REQUIRED		
Boat Length	No Fixed System	With Fixed System
Less than 26'	one B-1	0
26' to less than 40'	two B-1 or one B-2	one B-1
40' to 65'	three B-1 or one B-1 & one B-2	two B-1 or one B-2

- ☐ **6. VENTILATION:** Boats with gasoline engines in closed compartments, built after 1 August 1980 must have a powered ventilation system. Those built prior to that date must have natural or powered ventilation. Boats with closed fuel tank compartments built after 1 August 1978 must meet requirements by displaying a "certificate of compliance." Boats built before that date must have either natural or powered ventilation in the fuel tank compartment.
- ☐ **7. BACKFIRE FLAME ARRESTER:** All gasoline powered inboard/outboard or inboard motor boats must be equipped with an approved backfire flame control device.
- ☐ **8. SOUND PRODUCING DEVICES:** To comply with Navigation Rules and for distress signaling purposes all boats must carry a sound producing device (whistle, horn, siren, etc.) capable of a 4-second blast audible for ½ mile. Boats larger than 39.4 ft. are also required to have a bell (see Navigation Rules.)
- ☐ **9. NAVIGATION LIGHTS:** All boats must be able to display navigation lights between sunset and sunrise and in conditions of reduced visibility. Boats 16 feet or more in length must have properly installed, working navigation lights and an all-around anchor light capable of being lit independently from the red/green/white "running" lights.
- ☐ **10. POLLUTION PLACARD:** Boats 26 feet and over with a machinery compartment must display an oily waste "pollution" placard.
- ☐ **11. MARPOL TRASH PLACARD:** Boats 26 feet and over in length, operating in U.S. navigable waters, must display a "MARPOL" trash placard. Oceangoing boats 40 feet and over must also have a written trash disposal plan available onboard.
- ☐ **12. MARINE SANITATION DEVICE:** Any installed toilet must be a Coast Guard approved device. Overboard discharge outlets must be capable of being sealed.
- ☐ **13. NAVIGATION RULES:** Boats 39.4 feet and over must have on board a current copy of the Navigation Rules.
- ☐ **14. STATE AND LOCAL REQUIREMENTS:** A boat must meet the requirements of the state in which it is being examined.
- ☐ **15. OVERALL BOAT CONDITION: As it applies to this Vessel. Including, but not limited to:**
 - a. Deck free of hazards and clean bilge -** The boat must be free from fire hazards, in good overall condition, with bilges reasonably clean and visible hull structure generally sound. The use of automobile parts on boat engines is not acceptable. The engine horsepower must not exceed that shown on the capacity plate.
 - b. Electrical and Fuel Systems:** The electrical system must be protected by fuses or manual reset circuit breakers. Switches and fuse panels must be protected from rain or water spray. Wiring must be in good condition, properly installed and with no exposed areas or deteriorated insulation. Batteries must be secured and terminals covered to prevent accidental arcing. If installed, self-circling or kill switch mechanism must be in proper working order.
 - Fuel Systems - Portable fuel tanks** (normally 7 gallon capacity or less) must be constructed of non-breakable material and free of corrosion and leaks. All vents must be capable of being closed. The tank must be secured and have a vapor-tight, leak-proof cap. Each permanent fuel tank must be properly ventilated.
 - c. Galley and Heating Systems -** System and fuel tanks must be properly secured with no flammable materials nearby.

ATTACHMENT VI

OSHA POSTER

Job Safety and Health

It's the law!



Occupational Safety
and Health Administration
U.S. Department of Labor

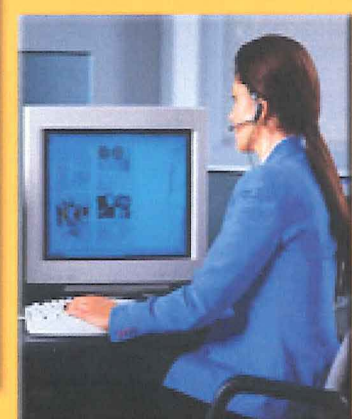
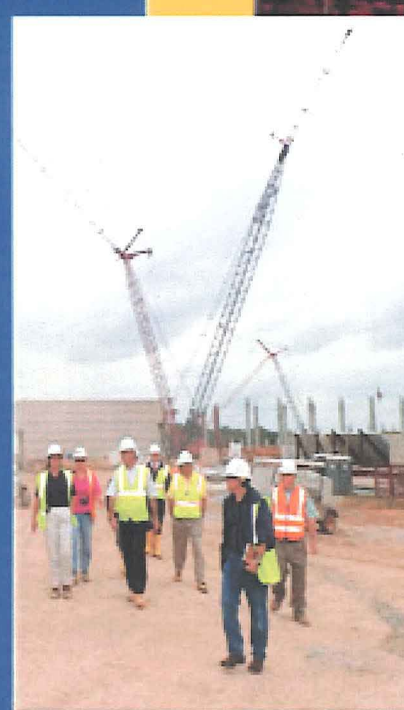
EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

This free poster available from OSHA –
The Best Resource for Safety and Health



Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA
www.osha.gov

OSHA 3105-12-00R